Infinity

Beta™ SW Series

SW-12 Subwoofer

SERVICE MANUAL

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Basic Specifications
SW-12 Powered Subwoofer

Frequency Range:	28Hz – 150Hz (±3dB)
Max Amplifier Output:	500 watts RMS
Low-Frequency Driver:	12" (305mm) C.M.M.D.
Crossover Frequency:	50 -150 Hz (24dB/octave, continuously variable)
Dimensions (H x W x D):	16-3/4" x 14-7/8" x 19-7/8" (425mm x 378mm x 505mm)
Weight:	45 lb (20.5 kg)

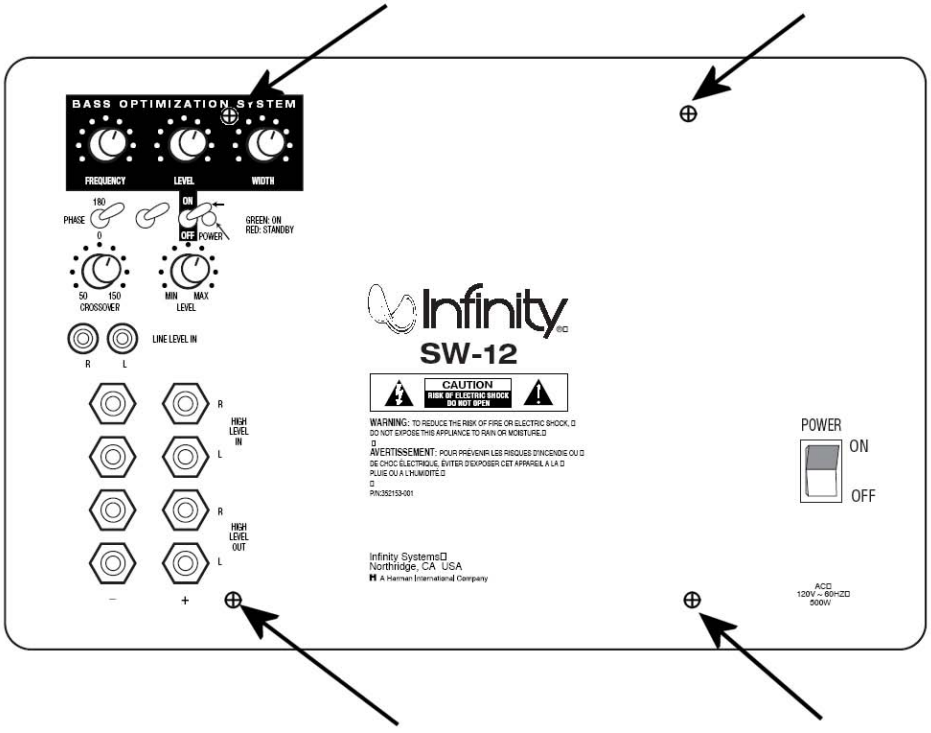
Infinity continually strives to update and improve existing products, as well as create new ones. The specifications and construction details in this and related Infinity publications are therefore subject to change without notice.

SW-12 300W Powered Sub/ Plate Amp

LINE VOLTAGE	Yes/No	Hi/Lo Line	Nom.	Unit	Notes
US 120vac/60Hz	Yes	108-132	120	Vrms	Normal Operation
EU 230vac/50-60Hz	Yes	207-264	230	Vrms	Normal operation, MOMS required

Parameter	Specification	Unit	QA Test Limits	Conditions	Notes
Amp Section					
Type (Class AB, D, other)	D	n/a	n/a		Bridge type amplifier, None of the speaker terminals must be connected to system GND at any time.
Load Impedance (speaker)	6	Ohms	n/a	Nominal	
Rated Output Power	250	Watts	225	1 input driven	Limiter prevents continuous power to exceed 240 Watts, amplifier delivering power in excess of 300 Watts at 4 Ohms of load impedance.
THD @ Rated Power	0.1	%	1	22K filter	
THD @ 1 Watt	0.1	%	0.2	22K filter	
Dynamic Power	400	Watts	380	Power is the average measurement of the first consecutive cycles of the burst signal	3/20 Cycles @ 50 Hz, burst test into 4 Ohms, input driven 6dB above its maximum sensitivity, volume level at Maximum, RABOS Section OFF
DC Offset	10	mV-DC	60	@ Speaker Outputs	
Damping factor	>50	DF	23	Measured at amplifier board	Measured at the speaker cable. 200 Watts, measured at speaker output terminals located at the amp board.
Input Sensitivity					
Input Frequency	30	Hz	30	Nominal Freq.	
L&R	14.7	mVrms	±2dB	To 1 Watt	Single input driven, Ap Zo=600 Ohms, LP ON, RABOS OFF, Volume ctrl & crossover at max
LP Off Mode selected	14.7	mVrms	±2dB	To 1 Watt	Single input driven , Ap Zo=600 Ohms, LP OFF, RABOS OFF, Volume ctrl & crossover at max
Speaker/Hi Level Input	0.206	Vrms	±2dB	To 1 Watt	Single input driven, Ap Zo=25 Ohms, LP ON, RABOS OFF, Volume ctrl & crossover at max
Signal to Noise					
SNR-A-Weighted	100	dBA	90	Relative to rated power	A-Weighting filter
SNR-unweighted	90	dBr	85	Relative to rated power	22K filter
SNR rel. 1W-unweighted	60	dBr	55	Relative to 1W Output	22K filter
Residual Noise Floor	0.5	mVrms	1	Volume @max, using RMS reading DMM/VOM (or A/P)	
Residual Noise Floor	0.5	mVrms(max)	1	Volume @max, w/ A/P Swept Bandpass Measurement (Line freq.+ harmonics)	
Input Impedance					
Line Input (L, R,LFE)	10K	ohms	n/a	Nominal	
Speaker/Hi Level Input	10K	ohms	n/a	Nominal	
Filters					
LP 4th order variable	50-150	Hz	± 10		
Subsonic filter (HPF) 2nd Orde	Fixed	Hz	± 10		
Low pass filter OFF	Fixed	Hz	± 10	L or R input driven, LP Filter OFF	
BOS					
Frequency Control		--			
Range	20-80	Hz	functional	21 detent pot (0.1 oct. steps)	
Level Control		--	--		
Range	-14.1 to 0	dB	functional	21 detent pot (0.5dB steps)	
Width(Q) Control		--	--		
Range	4.5% to 49.5%	octave	functional	21 detent pot (5steps/0.1 octave)	
Limiter					
THD at Max. Output Power	YES	n/a	functional		
Features	--				
Auto - On -Off	YES	--	functional		No switch to select the ATO mode is provided, Refer to ATO section
Phase switch	0-180	deg	functional		
Volume pot Taper (lin/log)	LOG	--	functional		A Taper
Variable crossover 50-150 Hz	YES		functional		4th Order LP Variable crossover
HP Speaker out	YES		functional		Pass through from the speaker input section
LP On- Off Select switch	YES	--	functional		Disables LP filter, intended for LFE
Input Configuration					

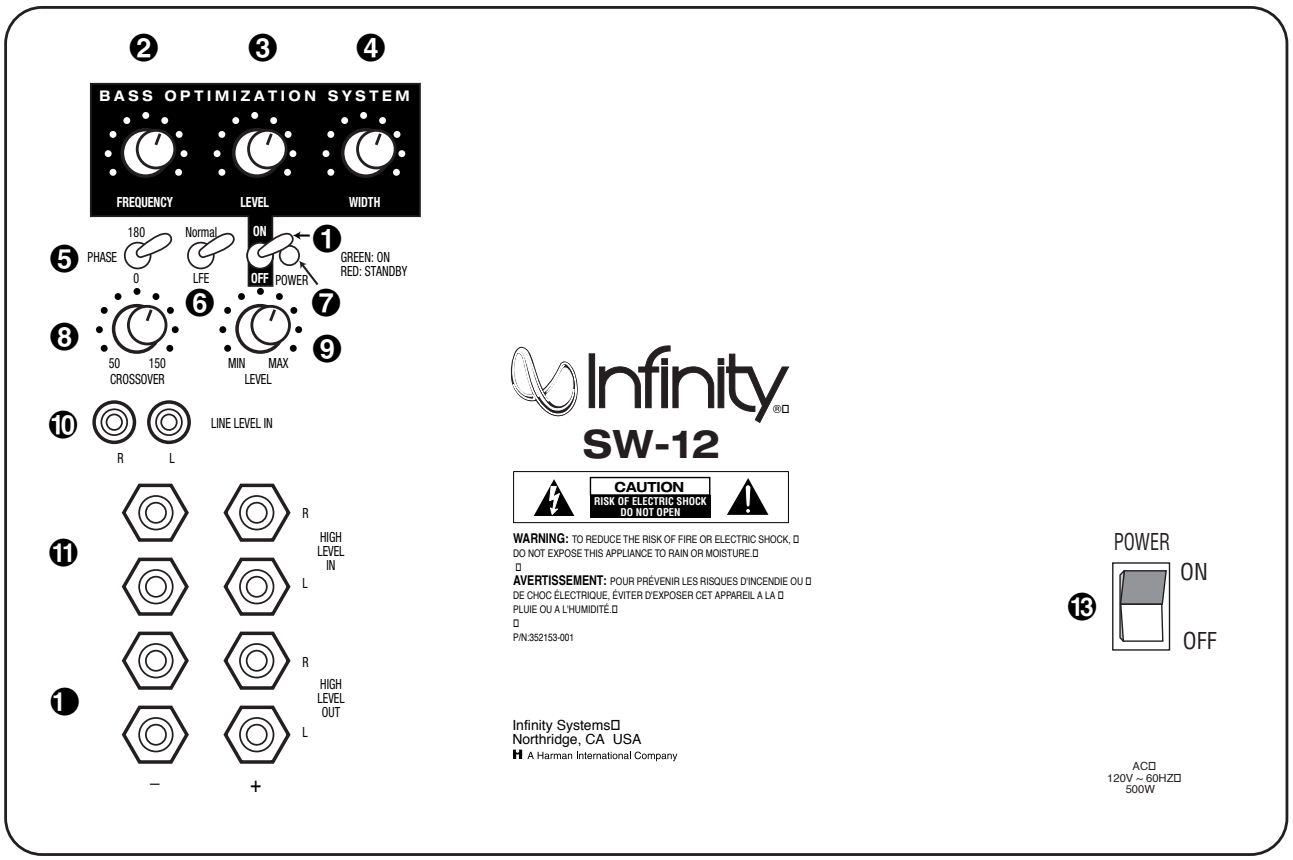
Parameter	Specification	Unit	QA Test Limits	Conditions	Notes
Line In (L,R) & LFE	YES	--	functional		Dual RCA jack, Lor R is used in LFE mode
Spkr/Hi Level In	YES	--	functional		Binding post connector L&R
Signal Sensing (ATO)					
Auto-Turn-On (yes/no)	YES		functional	Auto - on selection switch in Auto	
ATO Input test frequency	50	Hz	functional	"	
ATO Level LFE Input	2	mV	functional	"	
ATO Level Speaker in	50	mV	functional	"	
ATO Turn-on time	2	seconds	functional	Amp connected and AC on, then input signal applied	
Auto Mute/ Turn-OFF Time	15	minutes	17	(T) Time before muting, after input signal is removed	Auto turn of time (T) must be 10 > T < 17 Minut
Power on Delay time	3	sec.	4	AC Power Applied	
Transients/Pops					
ATO Transient	5	mV-peak	n/a	@ Speaker Outputs	
Turn-on Transient	50	mV-peak	1V-pk-pk	@ Speaker Outputs	AC Line cycled from OFF to ON
Turn-off Transient	50	mV-peak	1V-pk-pk	@ Speaker Outputs	AC Line cycled from ON to OFF
Efficiency					
Efficiency	70	%	65	Rated power	Nominal Line voltage 120 VAC
Stand-by Input Power	10		10	@ nominal line voltage, Amp in OFF state, RED LED activated	Maximum allowable input power LED in RED, Class D inactive
Stand-by Input Power	12	Watts	15	@ nom. line voltage, Amp in On state, Green LED activated	Maximum allowable input power under nominal Input voltage and frequency, in stand-by mode (HOT or COLD operation, LED GREEN). Class D active but no signal applied.
Power Cons. @ rated power	325	Watts	338	@ nom. line voltage	220 Watts @ 6.0 Ohms nominal line voltage
Protection					
Short Circuit Protection	YES		functional	Direct short at output	Amplifier should resume operation after short circuit condition removal
Thermal Protection	YES		functional	@1/8 max unclipped Power	Temperature rise in accessible metal parts should not exceed 35K rise for domestic version or 30K rise for European versions (refer to requirements sheet). Unit is protected for over-temperature conditions
DC Offset Protection	YES		-	DC present at Speaker Out leads	Relay opens duisng a DC output condition
Line Fuse Rating					
USA-Domestic	4	Amps		Type-T or Slo Blo-250 V	
EU	2	Amps		Type-T or Slo Blo-250 V	Internal fuse with UL/SEMKO rated holder



REMOVE THESE SCREWS TO REMOVE REAR COVER AND ACCESS AMPLIFIER

Controls and Connections

Rear Panel



Bass Optimization Controls (see page 5)

❶ Bass Optimization System Selector

❷ Center-Frequency Adjustment

❸ Bass Optimization System Level Adjustment

❹ Bass Optimization System Bandwidth Adjustment

❺ Phase Switch

❻ Normal/LFE Selector

❼ Power Indicator

❽ Crossover Adjustment

❾ Subwoofer Level (Volume) Control

❿ Line-Level Inputs

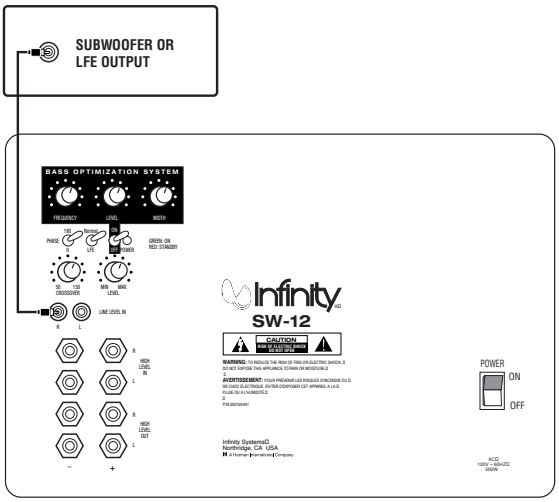
⓫ High-Level (Speaker) Inputs

❶ High-Level (Speaker) Outputs

⓭ Power Switch

Connections

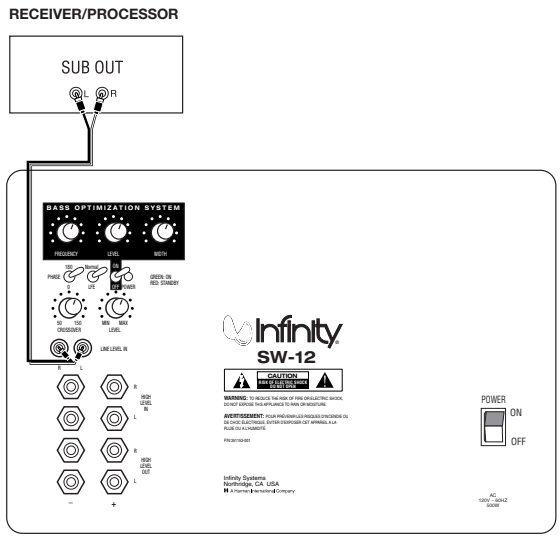
If you have a Dolby* Digital or DTS® receiver/processor with a low-frequency-effects (LFE) output:



- Set Normal/LFE Switch to LFE.

NOTE: In this case, you do not need to use a Y connector. Simply connect the LFE output on your receiver/processor to either the left or right input on the subwoofer.

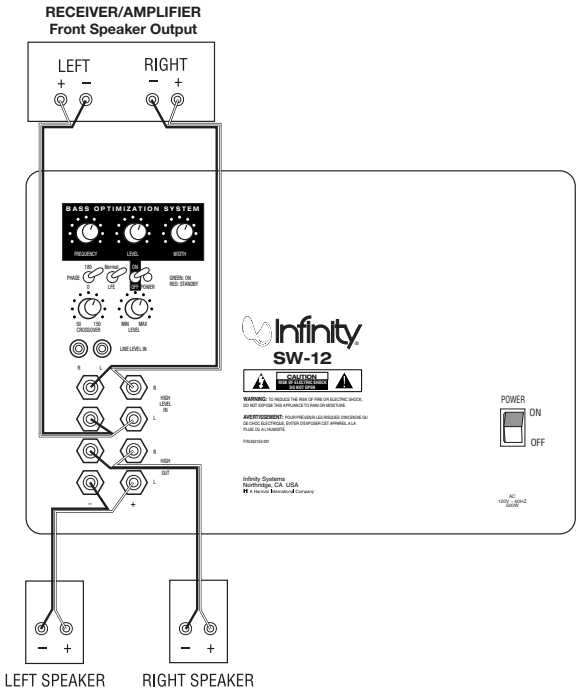
If your receiver/processor has subwoofer outputs for the left and right channels:



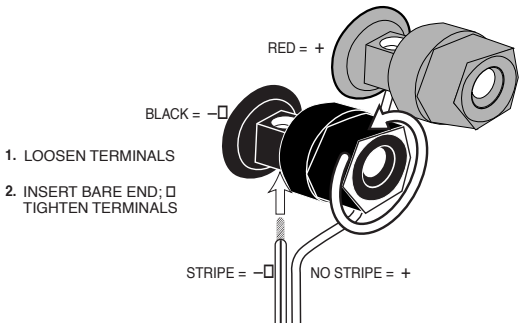
- Set Normal/LFE Switch to Normal.

NOTE: Some receivers have a single subwoofer output (do not confuse this with a single LFE output as described below). In that case, it is recommended that you use a Y connector (not included) to maximize performance.

If your receiver/amplifier does not have subwoofer outputs for the left and right channels or an LFE output:



- Set Normal/LFE Switch to Normal.



Operation

Power On

Plug your subwoofer's AC cord into a wall outlet. Do not use the outlets on the back of the receiver.
Initially set the Subwoofer Level (Volume) Control ❾ to the "min" position.
Turn on your sub by pressing the Power Switch ⓭ on the rear panel.

Auto On/Standby

With the Power Switch ⓭ in the ON position, the Power Indicator LED ❼ will remain backlit in red or green to indicate the On/Standby mode of the subwoofer.
RED = STANDBY (No signal detected, Amp Off)
GREEN = ON (Signal detected, Amp On)
The subwoofer will automatically enter the Standby mode after approximately 10 minutes when no signal is detected from your system. The subwoofer will then power ON instantly when a signal is detected. During periods of normal use, the Power Switch ⓭ can be left on. You may turn off the Power Switch ⓭ for extended periods of nonoperation, e.g., when you are away on vacation.

Adjust Gain

Turn on your entire audio system and start a CD or movie soundtrack at a moderate level. Turn up the Subwoofer Level (Volume) Control ❾ about half way. If no sound emanates from the subwoofer, check the AC-line cord and input cables. Are the connectors on the cables making proper contact? Is the AC plug connected to a "live" receptacle? Has the Power Switch ⓭ been pressed to the "On" position? Once you have confirmed that the subwoofer is active, proceed by playing a CD, record or cassette. Use a selection that has ample bass information.

Set the overall volume control of the preamplifier or stereo to a comfortable level. Adjust the Subwoofer Level (Volume) Control ❾ until you obtain a pleasing blend of bass. Bass response should not overpower the room but rather be adjusted so there is a harmonious blend across the entire musical range. Many users have a tendency to set the subwoofer volume too loud, adhering to the belief that a subwoofer is there to produce lots of bass. This is not entirely true. A subwoofer is there to enhance bass, extending the response of the entire system so the bass can be felt as well as heard. However, overall balance must be maintained or the music will not sound natural. An experienced listener will set the volume of the subwoofer so its impact on bass response is always there but never obtrusive.

Crossover Adjustments

NOTE: This control will have no effect if the Normal/LFE Selector Switch ❻ is set to "LFE." If you have a Dolby Digital or DTS processor/receiver, the Crossover Frequency is set by the processor/receiver. Consult your owner's manual to learn how to view or change this setting.

The Crossover Adjustment Control ❽ determines the highest frequency at which the subwoofer reproduces sounds. If your main speakers can comfortably reproduce some low-frequency sounds, set this control to a lower frequency setting, between 50Hz and 100Hz. This will concentrate the subwoofer's efforts on the ultradeep bass sounds required by today's films and music. If you are using smaller bookshelf speakers that do not extend to the lower bass frequencies, set the Crossover Adjustment Control to a higher setting, between 120Hz and 150Hz.

Phase Control

The Phase Switch ❺ determines whether the subwoofer speaker's piston-like action moves in and out with the main speakers, 0˚ or opposite the main speakers, 180˚. Proper phase adjustment depends on several variables such as room size, subwoofer placement and listener position. Adjust the phase switch to maximize bass output at the listening position.

Bass Optimization System™

Infinity's Bass Optimization System is a simple-to-use, yet sophisticated, low-frequency calibration system. The subwoofer contains a parametric equalizer that you can adjust following the directions below. By following these instructions, you can improve the sound of your system.

The Bass Optimization System Goal

It is a fact of audio that what we hear at low frequencies is determined as much or more by the listening room than by the loudspeaker itself. Placement of the loudspeakers and listeners and the acoustical characteristics of the room surfaces are all important determinants of bass quantity and quality. In most practical situations, there is little that can be done about this, except for patient trial-and-error repositioning of the loudspeakers and listeners. Usually, the practical constraints of a living space and the impracticality of massive acoustical treatment mean that equalization is the only practical solution.

Professional sound engineers routinely employ sophisticated measurement systems and equalizers to optimize speakers to the installation. This was never practical for the home audiophile. This is why the Bass Optimization System was created. It enables you to identify the dominant low-frequency response characteristic of your room. Once you know the problem, the Bass Optimization System provides the tools needed to optimize the low-frequency characteristics of the speakers to the room they are in, exactly as the professional sound engineers do it.

Preparations

Before beginning the bass tests, please check the following:

- Make sure all three Bass Optimization System controls on the subwoofer are turned fully clockwise.
- Make sure the loudness contour (if any) on your receiver/processor/preamp is turned off.
- Set the receiver's/processor's tone controls (Bass and Treble) to their center or flat positions.
- Bypass all surround and effects features of your receiver/processor/preamp or set to Stereo Bypass.
- If you are using a multichannel surround processor or receiver, make sure all bass-management features are properly set. The Audio channels should all be set to "Small" or "High-Pass" and the subwoofer set to "On."
- Set the Bass Optimization System Selector ❶ to "On."

For best results, it is recommended that all major furnishings are in place and that all doors and windows in the listening area are in their normal positions. That is, if you normally listen to music with all doors closed, then this is how they should be during this procedure.

To solve a problem, it helps to first identify whether you have one and, if so, what it is. First, play a variety of music and films with energetic bass sounds, like bass guitar, kick drum, keyboards, etc. A kick drum should produce a tight "thump," not a flabby "boom." Bass melody or harmony lines should have notes that are about equally loud. If some notes disappear, or stand out because they are consistently too loud, there is a problem. Disappearing notes have to be handled by moving the listening position, or the loudspeakers, to slightly different locations. Often, but sadly not always, this will be enough. Excesses in bass tend to be most annoying, and energetic resonances that cause "boomy" or "lumpy" bass can be truly aggravating over a period of time. Infinity's Bass Optimization System can fix this.

So, the first step is to exercise your music collection, and listen for low-frequency problems that crop up in several different recordings. Something that only happens in one recording is likely to be a problem in the recording – it happens! If you identify something that is consistently wrong, select a record that shows it very clearly, and put your CD/DVD player into a repeat mode (A-B repeat is especially helpful, because you can isolate a short musical passage).

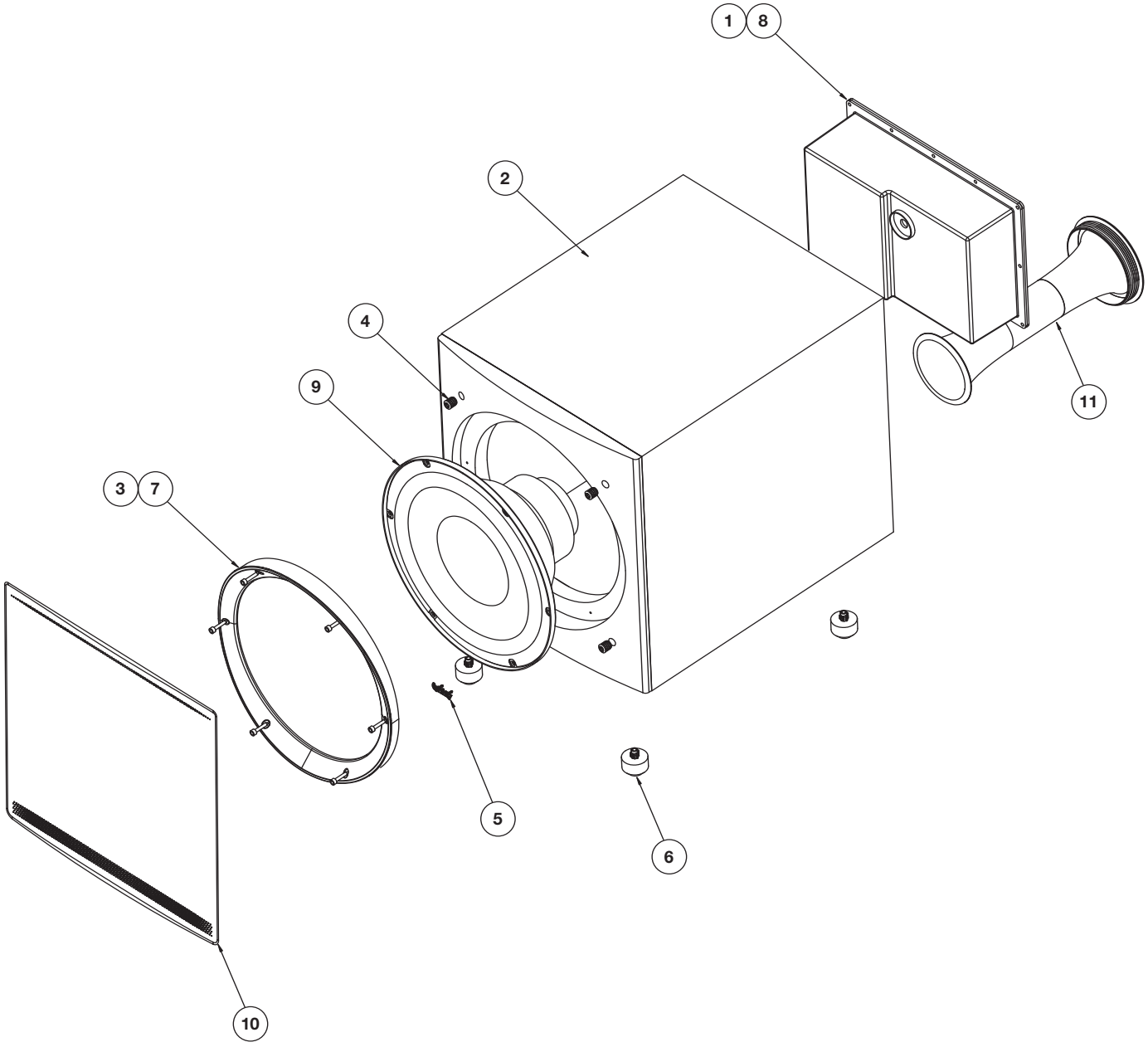
Set the Bass Optimization System Bandwidth Adjustment Control ❹ to a middle position (10 clicks from a fully clockwise position) and set the Level Adjustment ❸ for a –6dB (8 clicks from a fully clockwise position). Then, while the music is playing, sit in your favorite chair and have somebody else slowly adjust the Center-Frequency control ❷ from fully clockwise to fully counterclockwise. At a certain frequency, you should hear the problem lessen and the overall bass performance improve. When you are satisfied that you have found the best frequency, have your assistant vary the Level ❸ slowly up and down until you have maximized the improvement. If you have really keen ears, you can also have the Bandwidth Adjustment control ❹ adjusted for maximum benefit.

While the Bass Optimization System allows the listener to fine-tune the bass response to sound best in a particular room, some listeners don't have the skill or desire to adjust their system by ear. In order to facilitate quicker and more accurate results, Infinity has developed an optional test and measurement kit that allows the user to perform a series of measurements and aids him/her in properly setting the Bass Optimization System controls. With the addition of this kit, the Bass Optimization System becomes truly room-adaptive. The kit consists of the following: a test CD, a sound-level meter that is specifically calibrated for low frequencies, and something we call a "Q-Finder," a device to help find the width of the measured curve and, finally, a measurement template. It works as follows. The listener plays the tones from the test CD and records the relative output level of each test tone, using the sound-level meter, on the provided measurement template. After all the tones are complete, the template contains a response curve for the frequencies below 100Hz. The user simply notes the frequency of the largest bass peak, calculates the correct amount of attenuation, and uses the "Q-Finder" to determine the width of the curve. These three values are dialed into the Bass Optimization System controls located on the speaker. The entire process takes less than twenty minutes.

If your dealer does not stock the Bass Optimization System test and measurement kit, you may purchase it directly from Infinity. U.S. residents can visit our Web site at www.infinitysystems.com or call 1.516.674.4INF.

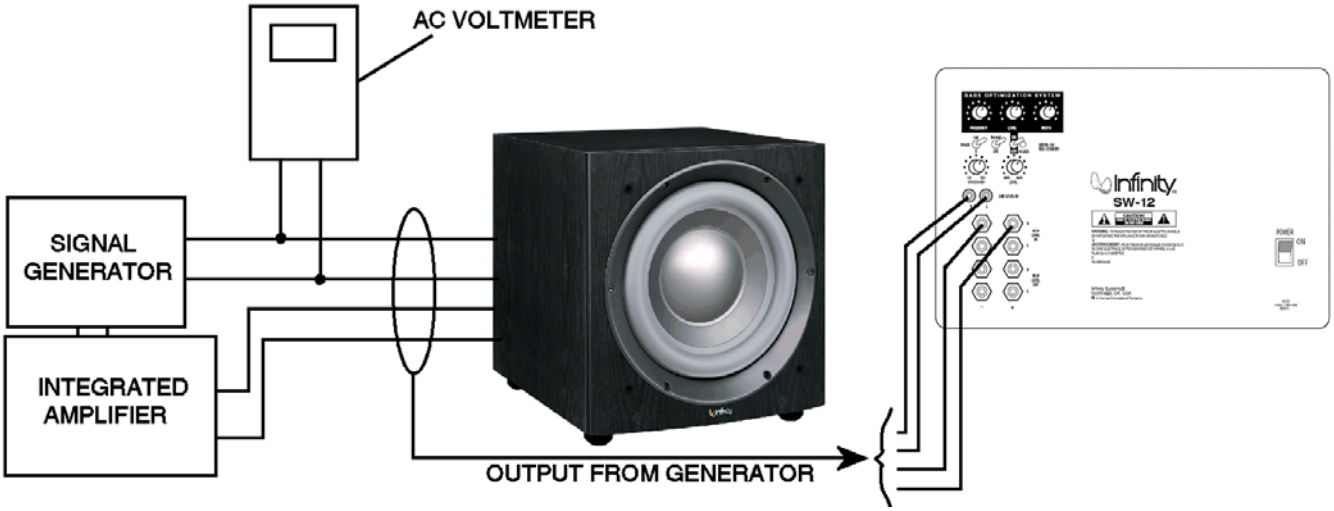
SW-12

EXPLODED VIEW



ITEM NO.	DESCRIPTION	QTY.	PART NO.
1.	SW-12 Amplifier	1	Not for Sale
2.	SW-12 Cabinet	1	Not for Sale
3.	Trim Ring, 12” SW-12 (Black)	1	351942-001
	Trim Ring, 12” SW-12 (Beech/Cherry)	1	351942-002
4.	Cup, Grille (Black)	4	333249-001
	Cup, Grille (Beech/Cherry)	4	333249-003
5.	Logo SW-12	1	351617-001
6.	Foot Assembly, Rubber, Blk w/Threaded Insert	4	338037-002
7.	Screw (woofer) (Black) 8 x 3/4, PAN, PH, PB, BLK ZINC, LCS	6	72216
	(Beech/Cherry)	6	903802-016
8.	Screw (amplifier) #6 x 3/4, PAN, PH, PB, BLK ZINC, LCS	10	882-41110-12
9.	Woofer, 12” Sub DCR=3.4 ohms ±10%	1	351511-001
10.	Grille Assembly, Frnt CSW-12 (Black)	1	352050-003
	(Beech/Cherry)	1	352050-004
11.	Port Tube SW-12	1	352179-001

SW-12 Test Set Up and Procedure



SYSTEM AURAL SWEEP TEST
Equipment needed:

- Function/signal generator/sweep generator
- Integrated Amplifier
- Multimeter
- RCA cables

General Unit Function (UUT = Unit Under Test)
Switches/knobs on the amplifier faceplate:

Crossover Frequency Adjust full CW (150Hz)
Phase switch – either position
RABOS On/Off switch – OFF
LFE switch - Normal

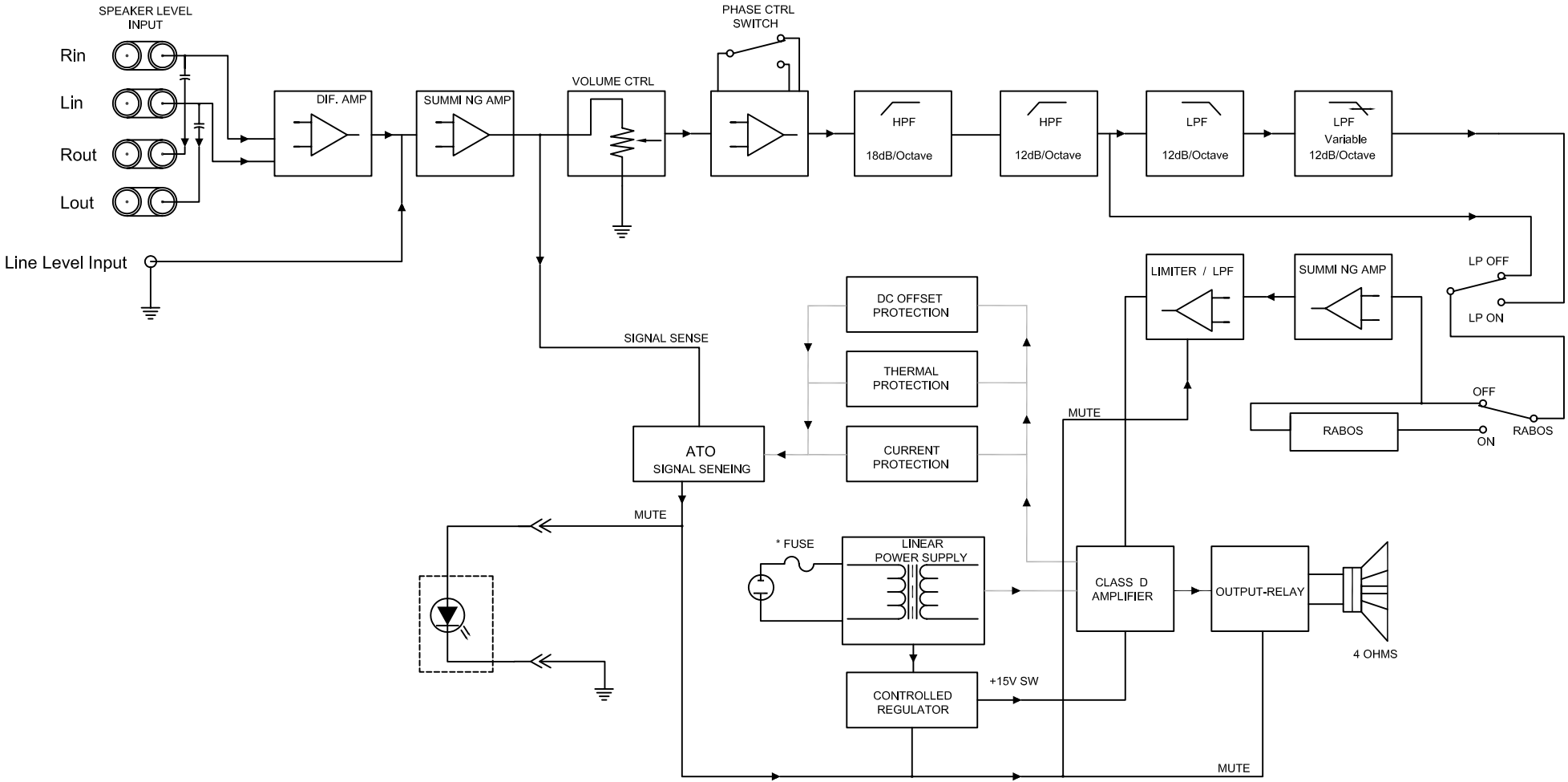
1. Remove the subwoofer grille.
2. From the signal generator, connect both right and left line level inputs (RCA jacks) – to signal generator and UUT. Use Y-cable if necessary from mono source.
3. On the amplifier, turn the LEVEL control full Counterclockwise (Min).
4. Turn on generator, adjust to **100mV, 50 Hz**.
5. Plug in UUT; turn the power switch ON. Turn LEVEL control full Clockwise (Max).
6. LED should now be Green; aggressive bass response should be seen from woofer – near maximum excursion.
7. Turn off generator, turn LEVEL control fully Counterclockwise (Min), disconnect RCA cable.
8. Connect one pair of speaker cables to one set of Speaker Level input terminals on UUT. Cables should be connected to an integrated amplifier fed by the signal generator.
9. Turn on generator and adjust so that speaker level input at the amplifier is **2.0V, 50 Hz.** Turn LEVEL control full Clockwise (Max).
10. Green LED should light; aggressive bass response should be seen from woofer – near maximum excursion.

Sweep Function

1. Follow steps 1-6 above, using a sweep generator as a signal source.
2. Sweep generator from 20Hz to 1kHz. Listen to the cabinet and drivers for any rattles, clicks, buzzes or any other noises. If any unusual noises are heard, remove woofer and test.

Driver Function (Woofer)

1. Remove woofer from cabinet; detach + and - wire clips.
2. Check DC resistance of woofer; it should be **3.4 ohms** ±10%.
3. Connect a pair of speaker cables to driver terminals. Cables should be connected to an integrated amplifier fed by a signal generator. Turn on generator and adjust so that speaker level output is **5.0**V.
4. Sweep generator from 20Hz to 1kHz. Listen to driver for any rubbing, buzzing, or other unusual noises.



NOTE :
120 VAC T4A-250V
230 VAC T2A-250V

SW-12 120v Electrical parts list				
Part number	Qty	Description		Reference Designator
MAIN PCB				
Resistors				
021-100401-020	1	MOF resistor	1K 1W J FK TYPE	R173
021-470305-021	1	MOF resistor	470R 5W J	R78
021-560305-020	1	MOF resistor	560R 5WS J 8x25 KINK	R76
022-005105-020	1	Resistor	PN:SQM 0R05 5W J 25x13	R2
024-000098-120	2	SMD Resistor	0R 1/8W J 0805	R8,193
024-100498-120	1	SMD Resistor	1K 1/8W J 0805	R110
024-100598-120	15	SMD Resistor	10K 1/8W J 0805	R5,7,16,118,121,122,125,1,
024-100698-120	2	SMD Resistor	100K 1/8W J 0805	R15,120
024-110598-120	4	SMD Resistor	11K 1/8W J 0805	R187,188,190,191
024-120498-120	2	SMD Resistor	1K2 1/8W J 0805	R189,192
024-130498-100	1	SMD Resistor	1K3 1/8W F 0805	R119
024-150598-120	2	SMD Resistor	15K 1/8W J 0805	R20,21
024-160598-100	2	SMD Resistor	16K 1/8W F 0805	R13,13B
024-220298-120	2	SMD Resistor	22R 1/8W J 0805	R28,29
024-220498-121	2	SMD Resistor	2K2 1/8W J 0805	R17,31
024-220598-120	1	SMD Resistor	22K 1/8W J 0805	R127
024-330498-120	4	SMD Resistor	3K3 1/8W J 0805	R77,79,22,169
024-330598-120	5	SMD Resistor	33K 1/8W J 0805	R4,6,14,60,60B
024-412498-100	1	SMD Resistor	4K12 1/8W F 0805	R63
024-470298-120	4	SMD Resistor	47R 1/8W J 0805	R24-27
024-470398-120	4	SMD Resistor	470R 1/8W J 0805	R145,155,177,186
024-470598-120	2	SMD Resistor	47K 1/8W J 0805	R3,171
024-510498-120	5	SMD Resistor	5K1 1/8W J 0805	R48A,48B,48C,48D,48E
024-560498-120	1	SMD Resistor	5K6 1/8W J 0805	R30
024-680498-120	1	SMD Resistor	6K8 1/8W J 0805	R23
Capacitors				
031-100184-100	2	SMD Capacitor	0u01/250V K 0805 X7R	C104,119
031-100244-100	2	SMD Ceramic Capacitor	0u01/50V K 0805 X7R	C27,28
031-100344-100	6	SMD Capacitor	0u1/50V K 0805 X7R	C10,69,112,115,135,138
031-100384-100R	2	SMD Capacitor	0u1/250V K 1206 X7R	C5,6
031-220344-300	1	SMD Capacitor	220pF/50V K 0805 NPO	C40
031-470144-101	1	SMD Capacitor	0u0047/50V K 0805 X7R	C1G1
032-100484-200	3	END Mylar Capacitor	1uF/250V K P:15	C37,39,30
033-330444-270	2	NPE Capacitor	3u3/50V K10 (R)8x13 SBE	C114,137
033-680464-270	2	NPE Capacitor	6u8/100V K10 (R)1020 GNE	C113,136
034-100614-300	1	Eletrolytic Capacitor	100uF/16V M (R)0611 P:2.5	C8
034-100625-300	1	Eletrolytic Capacitor	100uF/25V M (R)6.3x11 P:5	C62
034-100695-300	1	Eletrolytic Capacitor	100uF/63V M (R)1012 P:5	C142
034-100895-204	2	Eletrolytic Capacitor	10000uF/63V M (R)30x51	C1,4
034-220525-300	2	Electrolytic Capacitor	22uF/25V M (R)5x11 P:2.5 TAPIN	C25,26
034-330625-300	2	Electrolytic Capacitor	330uF/25V M (R)1013 P:5	C11,100
034-470415-300	1	Electrolytic Capacitor	4u7/50V M (R)0511 P:2.0	C7
Semiconductors				
051-000600-100	1	Transistor PNP	PN:MPSW06RLRA TO-92 (ON)	Q6

Part number	Qty	Description		Reference Designator
MAIN PCB				
051-005600-100	1	Transistor PNP	PN:MPSW56RLRA TO-92 (ON)	Q8
051-290700-100	4	Transistor PNP (ON)	PN:MPS2907A RLRA TO-92	Q12,14,16,18
051-540101-000	1	Transistor PNP(FAIRCHILD)	PN:2N5401 TO-92	Q3
051-640001-000	4	MOSFET N-Channel	PN:IRF640N TO-220 (IR)	Q11,13,15,17
052-400080-000	1	Bridge Regulator	PN:RS804 400V,8A	BR1
053-257400-100	1	IC;DIP,Regulator	PN:LM2574 HVN-15V 8PIN (NS)	U6
054-000100-100	6	SMD DIODE	PN:ES1D 200V 1A	D1,23,37,40,44,47
054-001002-100	1	SMD ZENER DIODE	PN:BZX84C10 10V SOT-23	D32
054-001501-100	2	SMD ZENER DIODE	PN:BZX84C15 15V SOT-23	D2,3
054-033904-100	6	SMD Transistor	PN:MMBT3904LT1 SOT23 (ON	Q25,28,29,37,50,51
054-033906-100	5	SMD Transistor	PN:MMBT3906LT1 SOT23 (ON	Q26,27,30,36,52
054-050601-100	1	SMD ZENER DIODE	PN:BZX84C5V6 5.6V SOT-23 TAPIN	D30
054-414803-100	16	SMD Diode	PN:LL4148 (Wishay)	D4-5,13,14,21,22,31,33,38,
054-540100-100	1	SMD Transistor (PNP)	PN:MMBT5401 LT1 SOT-23	Q1
054-555100-100	1	SMD Transistor (NPN)	PN:MMBT5551 LT1 (ON)	Q2
Miscellaneous				
025-010300-000	1	Thermister	TSE-103 K L:50mm	TH1
043-300101-000	2	INDUCTOR	PN:YT-10033 30uH	L9,10
043-560200-000	1	INDUCTOR	56uH YT-10779	L12
043-700100-000	1	INDUCTOR	70uHx2 YT-10024	L8
043-820300-000	1	INDUCTOR	820uH YT-10034	L1
044-100100-000	2	SMD FERRITE BEAD	PN:321611 600R/100MHz 1206	FB1,FB2
072-040008-110	1	8P Terminal housing	JS-1001-08	P1
072-040039-000	1	Terminal (PCB TYPE)	PC205 (t=0.8m/m) T205MA	T1
072-040064-000	2	Terminator (PCB TYPE)	PC250(t=0.8),T250MA	T2,TER6
072-040096-000	2	Terminator T187MA(PCB TYPE)	(t=0.8mm) PC187(0.8)	TER5,TER7
073-111003-000	1	Shorting Strap	54.9x13.6x1mm	J7
073-111004-000	2	Shorting Strap	29.5x12.4x0.8m/m	J4,9
074-300018-000	1	RELAY	PN:943-1C-48D	RLY1
PRE DRIVER PCB				
Resistors				
024-000098-120	4	SMD Resistor	0R 1/8W J 0805	R313,314,318,320
024-100298-120	4	SMD Resistor	10R 1/8W J 0805	R89,90,140,150
024-100498-120	10	SMD Resistor	1K 1/8W J 0805	R81,85,96,97,131,137,142,
024-100598-120	12	SMD Resistor	10K 1/8W J 0805	R75,82,83,92,98,132,133,
024-100798-120	2	SMD Resistor	1M 1/8W J 0805	R32,33
024-110598-120	2	SMD Resistor	11K 1/8W J 0805	R74,99
024-200598-120	2	SMD Resistor	20K 1/8W J 0805	R95,141
024-220398-120	2	SMD Resistor	220R 1/8W J 0805	R136,167
024-220498-121	1	SMD Resistor	2K2 1/8W J 0805	R134
024-220598-120	1	SMD Resistor	22K 1/8W J 0805	R37
024-220798-120	2	SMD Resistor	2M2 1/8W J 0805	R87,93
024-270498-120	3	SMD Resistor	2K7 1/8W J 0805	R80,84,157
024-390498-120	2	SMD Resistor	3K9 1/8W J 0805	R130,161
024-390598-120	2	SMD Resistor	39K 1/8W J 0805	R86,94
024-470398-120	1	SMD Resistor	470R 1/8W J 0805	R91
024-470498-120	6	SMD Resistor	4K7 1/8W J 0805	R151-153,183,34,36

Part number	Qty	Description		Reference Designator
PRE DRIVER PCB				
024-470598-120	1	SMD Resistor	47K 1/8W J 0805	R35
024-560598-120	1	SMD Resistor	56K 1/8W J 0805	R38
024-680498-120	2	SMD Resistor	6K8 1/8W J 0805	R135,166
Capacitors				
031-100244-100	4	SMD Ceramic Capacitor	0u01/50V K 0805 X7R	C108,118,131,140
031-100343-100	2	SMD Capacitor	100pF/50V J 0805 NPO	C81,84
031-100344-100	6	SMD Capacitor	0u1/50V K 0805 X7R	C75-78,82,85
031-180344-100	2	SMD Capacitor	0u18/50V K 0805 X7R	C80,83
031-470244-102	4	SMD Capacitor	0u047/50V K 0805 X7R	C93,94,101,124
031-560243-100	4	SMD Capacitor	56pF/50V J 0805 NPO	C92,102,105,125
031-560343-102	1	SMD Capacitor	560pF/50V J 0805 NPO	C79
034-100625-303	1	Electrolytic Capacitor	100uF/25V M (R) P:2.5	C117
034-100715-202	2	Electrolytic Capacitor	1000uF/16V M (R)1017 P:5	C109,132
034-330615-301	1	Electrolytic Capacitor	330uF/16V M (R)0812 P:3.5	C32
Semiconductors				
051-000600-100	1	Transistor NPN	PN:MPSW06RLRA TO-92 (ON)	Q31
051-222200-100	2	Transistor NPN	PN:MPS2222ARLRA TO-92	Q20,22
051-555100-000	2	Transistor NPN	PN:2N5551 TO-92	Q21,23
053-211100-000	2	IC;DIP,DRIVER	PN:IR2111 8PIN (IR)	U7,8
054-000100-100	2	SMD DIODE	PN:ES1D 200V 1A	D35,43
054-001002-100	2	SMD ZENER DIODE	PN:BZX84C10 10V SOT-23	D42,49
054-005501-100	1	SMD ZENER DIODE	PN:BZV55C3V6 (PHILIPS)	D60
054-007200-100L	2	SMD IC; DUAL OP-AMP	PN:M072M-TE1 DMP8 (JRC)	U9,10
054-033906-100	2	SMD Transistor	PN:MMBT3906LT1 SOT23 (ON	Q34,35
054-050601-100	2	SMD ZENER DIODE	PN:BZX84C5V6 5.6V SOT-23	Z7,8
054-414803-100	5	SMD DIODE	PN:LL4148 (Wishay)	D36,39,46,52,61
054-540100-100	2	SMD Transistor (PNP)	PN:MMBT5401 LT1 SOT-23	Q33,40
054-555100-100	1	SMD Transistor (NPN)	PN:MMBT5551 LT1 (ON)	Q32
Miscellaneous				
072-040229-000	1	HEADER Right Angle	PN:211-107-000-400 7PIN	PIN2
072-040230-000	1	HEADER Right Angle	PN:211-111-000-400 11PIN	PIN1
INPUT PCB ASS'Y (4 PCB's)				
Resistors				
021-100398-100	1	MF resistor	100R 1/8W F	R339
021-100498-100	2	MF resistor	1K 1/8W F	R363,381
021-100598-100	9	MF resistor	10K 1/8W F	R338,342,343,346,348,353,
021-100698-100	1	MF resistor	100K 1/8W F	R383
021-100798-100	1	MF resistor	1M 1/8W F	R356
021-100898-100	1	MF resistor	10M 1/8W F	R362
021-110698-100	1	MF resistor	110K 1/8W F	R347
021-121598-100	2	MF resistor	12K1 1/8W F	R354,369
021-140598-100	1	MF resistor	14K 1/8W F	R380
021-150198-100	1	MF resistor	1K5 1/8W F	R341

Part number	Qty	Description		Reference Designator
INPUT PCB ASS'Y (4 PCB's)				
021-162398-100	1	MF resistor	162R 1/8W F	R384
021-220598-100	1	MF resistor	22K 1/8W F	R382
021-267498-100	1	MF resistor	2K67 1/8W F	R336
021-340398-100	2	MF resistor	340R 1/8W F	R357,371
021-357498-100	1	MF resistor	3K57 1/8W F	R335
021-430498-100	1	MF resistor	4K3 1/8W F	R204
021-549398-100	1	MF resistor	549R 1/8W F	R344
021-619498-100	2	MF resistor	6K19 1/8W F	R359,374
021-620598-100	1	MF resistor	62K 1/8W F	R214
021-680398-100	1	MF resistor	680R 1/8W F	R360
021-787398-100	2	MF resistor	787R 1/8W F	R350,364
021-909398-100	1	MF resistor	909R 1/8W F	R385
021-931498-100	1	MF resistor	9K31 1/8W F	R351
024-000097-120	6	SMD Resistor	0R 1/4W J 1206	R301-303,309,296,297
024-100398-121	1	SMD Resistor	100R 1/4W J 1206	R249
024-100498-121	2	SMD Resistor	1K 1/4W J 1206	R238,264
024-100598-101	5	SMD Resistor	10K 1/4W F 1206	R200B,201B,218B,219B,298
024-100598-121	16	SMD Resistor	10K 1/4W J 1206	R202,205-207,212,217,222,
024-100698-101	4	SMD Resistor	100K 1/8W F 1206	R200,201,218,219
024-150498-121	1	SMD Resistor	1K5 1/4W J 1206	R251
024-150598-121	1	SMD Resistor	15K 1/4W J 1206	R223
024-200598-121	1	SMD Resistor	20K 1/4W J 1206	R256
024-226598-100	4	SMD Resistor	22K6 1/4W F 1206	R208,209,231,232
024-237597-100	1	SMD Resistor	23K7 1/4W F 1206	R281
024-270498-121	1	SMD Resistor	2K7 1/4W J 1206	R237
024-300398-121	1	SMD Resistor	300R 1/4W J 1206	R258
024-300598-121	1	SMD Resistor	30K 1/4W J 1206	R260
024-330498-101	2	SMD Resistor	3K3 1/4W F 1206	R203,215
024-330498-121	1	SMD Resistor	3K3 1/4W J 1206	R240
024-470498-121	1	SMD Resistor	4K7 1/4W J 1206	R210
024-470598-120	2	SMD Resistor	47K 1/8W J 0805	R280,283
024-470698-121	1	SMD Resistor	470K 1/4W J 1206	R259
024-470798-121	2	SMD Resistor	4M7 1/4W J 1206	R243 ,244
024-510398-121	1	SMD Resistor	510R 1/4W J 1206	R261
024-560598-121	1	SMD Resistor	56K 1/4W J 1206	R224
024-620398-121	2	SMD Resistor	620R 1/4W J 1206	R221,226
024-680498-121	1	SMD Resistor	6K8 1/4W J 1206	R247
024-680598-121	1	SMD Resistor	68K 1/4W J 1206	R250
024-820598-121	1	SMD Resistor	82K 1/4W J 1206	R263
026-100595-001	2	VR 10KAX2 RABOS WIDTH, LEVEL	XV012311YGPJ25F15A10K-21PC/1	VR302,303
026-100595-002	1	VR 10KCx2 RABOS FREQUENCY	XV012311YGPJ25F15C10K-21PC/1	VR301
026-500595-254	1	VR 50KA GAIN	P/N:RK163111R405-EJ	R216
026-500595-267	1	VR 50KBX4 FREQUENCY	PN:RD1631411001D-50KBx4 (EJ)	R233
Capacitors				
031-100244-101	4	SMD Capacitor	0u01/50V K 1206 X7R	C12,13,224,280
031-100344-102L	7	SMD Capacitor	0u1/50V K 1206 X7R	C227,229,230,232-235
031-100344-104	2	SMD Capacitor	100pF/50V K NPO 1206	C204,222
031-100345-300	2	SMD Capacitor	0u1/50V M 1206 X7R	C305,306
031-220344-103	4	SMD Capacitor	220pF/50V K NPO 1206	C200,210,215,216
031-330445-100	1	SMD Capacitor	3300pF/50V M 1206 X7R	C281

Part number	Qty	Description		Reference Designator
INPUT PCB ASS'Y (4 PCB's)				
031-470444-101	1	SMD Capacitor	4700pF/50V K X7R 1206	C2G1
031-680444-100	1	SMD Capacitor	6800pF/50V K X7R 1206	C212
034-100515-300G	1	Electrolytic Capacitor	10uF/16V M (R)0511 P:2	C220
034-100615-301	1	Electrolytic Capacitor	100uF/16V M (R)0611 P:5	C221
034-220516-301	2	Electrolytic Capacitor	22uF/16V M (R)0511 P:2	C223,225
034-220525-300	4	Electrolytic Capacitor	22uF/25V M (R)5x11 P:2.5 TAPIN	C303,304,14,15
035-100363-300	3	PE Capacitor	0u1/100V J P:5m/m	C322,323,328
035-220243-100	1	PECapacitor FE-M	0u022/63V J P:5m/m	C202
035-330293-300	2	PE Capacitor	0u033/63V J P:5	C209,218
035-330393-300	2	ESKMylar Capacitor	0u33/63V J P:5	C207,208
035-680253-300	4	PE Capacitor FE-M	0u068/63V J P:5m/m	C201,213,380,381
Semiconductors				
050-505200-001	1	LED	PN:LT-2402-21	LED1
054-007200-100L	7	SMD IC; DUAL OP-AMP	PN:M072M-TE1 DMP8 (JRC)	U200-205,301
054-007400-100	1	SMD IC;(OP) QUAD OP-AMP	PN:TL074CDR (TI)	U300
054-011400-100	1	SMD Transistor	PN:DTC114TKA SMT3 (ROHM	Q202
054-033904-100	2	SMD Transistor	PN:MMBT3904LT1 SOT23	Q203,204
054-414803-100	12	SMD DIODE	PN:LL4148 (Wishay)	D200-205,207,209,212,216,
Miscellaneous				
072-010058-000	1	RCA JACK 2P	PN:0502000W1G (Red,White)	J201
072-040007-000	2	7P Terminal housing SWA101	JS-1001-07	P3,4
072-040008-110	1	8P Terminal housing	JS-1001-08	P2
072-040253-000	1	HEADER Right Angle	PN:211-103-000-400 3PIN	M3
072-040337-000	1	HEADER Right Angle	PN:211-110-000-400 10PIN	M4
072-040338-000	1	HEADER Right Angle	PN:211-105-000-400 5PIN	M3
072-060219-000	1	BINDING POST (gold plated)	PN:A807A-RB 8PIN	J200
073-010021-000	3	Screw base	PN:PCB-2(M3) 4PIN	T1,2,3
074-030002-000	3	TOGGLE SW	PN:L101-T2B4QE	SW200-202
FUSE SET PCB				
039-220180-100	1	X2 Safety Capacitor 0.22uF/250V	18x16.5x8.5mm PN:XG275M224VHS2	CXAC1
043-324300-000	1	INDUCTOR	324uH YT-10778	L13
072-040064-000	1	Terminal (PCB TYPE)	PC250(t=0.8),T250MA	TER2
072-040096-000	3	TerminalT187MA(PCB TYPE)	(t=0.8mm) PC187(0.8)	TER1,3,4
073-050001-000	2	FUSE CLIP	P/N:CFFH1206	F1B1
091-000128-000	1	FUSE	T4A/250V φ5x20m/m	F1
MISC/MECHANICAL				
061-001021-000	2	Knob	PN49001-WD7 φ16x14	for VR301-303
061-001052-000	2	Knob	PN:49001-W D=15.1 H=14.5	for R233,216
061-100016-000		Partition Post	PN:BCMS-8 L=8mm Nylon 66(UL)	
061-314002-000		Strain Relief	P/N SB4F-2	PANEL,COVER
061-700044-000		Mylar	13x18mm TO-220	for Q13,17
061-700090-900		Washer	16x21mm t=2mm	for Q11,15
063-010010-000		Bracket for Power Transistor	P/N:TRK-2	for Q11,13,15,17,TH1
063-332101-000		Bucket	12.83"x8.33"x3.93" ABS 94V0	

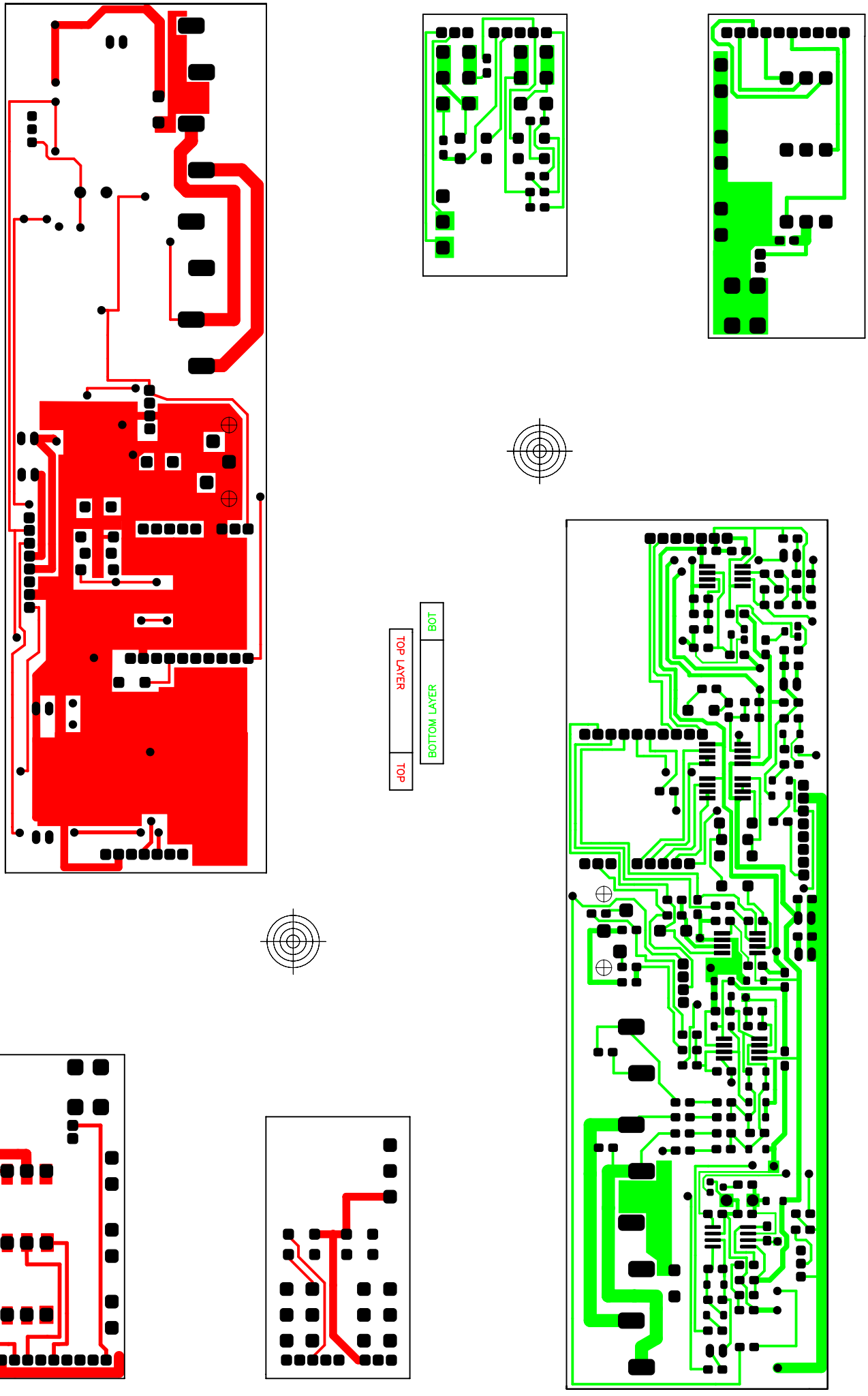
Part number	Qty	Description		Reference Designator
063-332108-900		Panel	12.83x8.33" t=.984" SPCC	
071-060280-500		Washer	8#-32 8.5 t=3m/m	
071-100606-060		Washer	PN:WS3-2 OD=6 ID=3.t=2mm	Q11,13
073-014044-000		Bracket	6.64"x3.50"x3.20" SPCC	
074-020018-000		Rocker SW	PN:RF1003-BB4-0	
082-022611-000		Wire Set #26 UL1007	L=110mm blk+wht x6 XH7Px2	P3
082-082620-000		Wire Set #26 UL1007	L=200mm XH8Px2 blk/wht	P2
086-021836-000		Power Cable	SPT-2 #18 +T187	
181-911800-338		Wire Set #18AWG UL1007	blk L=110mm	C211
181-921422-002		Wire Set #14AWG UL1015	Red 625mm	SPE+
181-921600-000		BLK Wire #16 UL1015	T187 L:140mm	
181-921699-000		WHT Wire #16 UL1015	T187 L:160mm	
008-060302-000		Gasket(UL)	C4305 25x22x1m/m BLK	
008-060302-072		Gasket(UL)	PN:MO-48C 25x18 t=5mm	
008-061215-000		Gasket C4305	12x15 t=5mm CR	
008-062001-000		Gasket CR C4305	196x10mm t=1mm	
008-063001-000		Gasket CR C4305	320x10mm t=1mm	
042-014107-001		Transformer	EI-125 YT-9313-2	

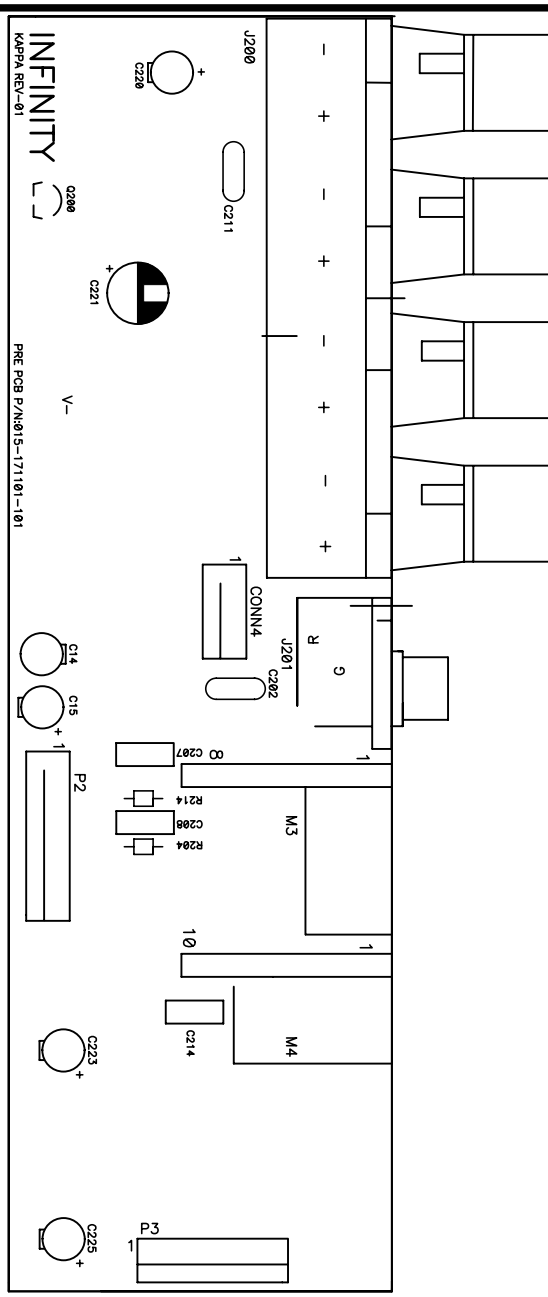
SW-12 230v Electrical parts list				
Part number	Description		Qty	Reference Designator
MAIN PCB				
Resistors				
021-100401-020	MOF resistor	1K 1W J FK TYPE	1	R173
021-470305-021	MOF resistor	470R 5W J (NORMAL SIZE)	1	R78
021-560305-020	MOF resistor	560R 5WS J 8x25 KINK	1	R76
022-005105-020	Resistor	PN:SQM 0R05 5W J 25x13	1	R2
024-000098-120	SMD Resistor	0R 1/8W J 0805	2	R8,193
024-100498-120	SMD Resistor	1K 1/8W J 0805	1	R110
024-100598-120	SMD Resistor	10K 1/8W J 0805	15	R5,7,16,118,121,122,125,1,126,128,138,165,17
024-100698-120	SMD Resistor	100K 1/8W J 0805	2	R15,120
024-110598-120	SMD Resistor	11K 1/8W J 0805	4	R187,188,190,191
024-120498-120	SMD Resistor	1K2 1/8W J 0805	2	R189,192
024-130498-100	SMD Resistor	1K3 1/8W F 0805	1	R119
024-150598-120	SMD Resistor	15K 1/8W J 0805	2	R20,21
024-160598-100	SMD Resistor	16K 1/8W F 0805	2	R13,13B
024-220298-120	SMD Resistor	22R 1/8W J 0805	2	R28,29
024-220498-121	SMD Resistor	2K2 1/8W J 0805	2	R17,31
024-220598-120	SMD Resistor	22K 1/8W J 0805	1	R127
024-330498-120	SMD Resistor	3K3 1/8W J 0805	4	R77,79,22,169
024-412498-100	SMD Resistor	4K12 1/8W F 0805	1	R63
024-470298-120	SMD Resistor	47R 1/8W J 0805	4	R24-27
024-470398-120	SMD Resistor	470R 1/8W J 0805	4	R145,155,177,186
024-470598-120	SMD Resistor	47K 1/8W J 0805	2	R3,171
024-510498-120	SMD Resistor	5K1 1/8W J 0805	5	R48A,48B,48C,48D,48E
024-560498-120	SMD Resistor	5K6 1/8W J 0805	1	R30
024-680498-120	SMD Resistor	6K8 1/8W J 0805	1	R23
025-010300-000	Thermister	TSE-103 K L:50mm	1	TH1
024-330598-120	SMD Resistor	33K 1/8W J 0805	4	R4,6,60,60B
024-430598-120	SMD Resistor	43K 1/8W J 0805	1	R14
Capacitors				
031-100184-100	SMD Capacitor	0u01/250V K 0805 X7R	2	C104,119
031-100244-100	SMD Ceramic Capacitor	0u01/50V K 0805 X7R	2	C27,28
031-100344-100	SMD Capacitor	0u1/50V K 0805 X7R	6	C10,69,112,115,135,138
031-100384-100R	SMD Capacitor	0u1/250V K 1206 X7R	2	C5,6
031-220344-300	SMD Capacitor	220pF/50V K 0805 NPO	1	C40
031-470144-101	SMD Capacitor	0u0047/50V K 0805 X7R	1	C1G1
032-100484-200	END mylar capacitor	1uF/250V K P:15	3	C37,39,30
033-330444-270	NPE Capacitor	3u3/50V K10 (R)8x13 SBE	2	C114,137
033-680464-270	NPE Capacitor	6u8/100V K10 (R)1020 GNE	2	C113,136
034-100614-300	Electrolytic Capacitor,	100uF/16V M (R)0611 P:2.5	1	C8
034-100625-300	Electrolytic Capacitor,	100uF/25V M (R)6.3x11 P:5	1	C62
034-100695-300	Electrolytic Capacitor	100uF/63V M (R)1012 P:5	1	C142
034-100895-205	Electrolytic Capacitor 105□	10000uF/63V M (R)35x52	2	C1,4
034-220525-300	Electrolytic Capacitor	22uF/25V M (R)5x11 P:2.5 TAPIN	2	C25,26
034-330625-300	Electrolytic Capacitor	330uF/25V M (R)1013 P:5	2	C11,100
034-470415-300	Electrolytic Capacitor	4u7/50V M (R)0511 P:2.0	1	C7
Semiconductors				
051-000600-100	Transistor NPN	PN:MPSW06RLRA TO-92 (ON)	1	Q6
051-005600-100	Transistor PNP	PN:MPSW56RLRA TO-92 (ON)	1	Q8
051-290700-100	Transistor PNP (ON)	PN:MPS2907A RLRA TO-92	4	Q12,14,16,18
051-540101-000	Transistor PNP(FAIRCHILD	PN:2N5401 TO-92	1	Q3
051-640001-000	MOSFET N-Channel	PN:IRF640N TO-220 (IR)	4	Q11,13,15,17
052-400080-000	Bridge Rectifier	PN:RS804 400V,8A	1	BR1
053-257400-100	IC;DIP,Regulator	PN:LM2574 HVN-15V 8PIN (NS)	1	U6
054-000100-100	SMD DIODE	PN:ES1D 200V 1A	6	D1,23,37,40,44,47
054-001002-100	SMD ZENER DIODE	PN:BZX84C10 10V SOT-23	1	D32
054-001501-100	SMD ZENER DIODE	PN:BZX84C15 15V SOT-23	2	D2,3
054-033904-100	SMD Transistor	PN:MMBT3904LT1 SOT23 (ON	6	Q25,28,29,37,50,51
054-033906-100	SMD Transistor	PN:MMBT3906LT1 SOT23 (ON	5	Q26,27,30,36,52
054-050601-100	SMD ZENER DIODE	PN:BZX84C5V6 5.6V SOT-23 TAPIN	1	D30
054-414803-100	SMD DIODE	PN:LL4148 (Vishay)	16	D4-5,13,14,21,22,31,33,38,41,45,48,34,6,90,9
054-540100-100	SMD Transistor (PNP)	PN:MMBT5401 LT1 SOT-23	1	Q1

Part number	Description		Qty	Reference Designator
MAIN PCB				
054-555100-100	SMD Transistor (NPN)	PN:MMBT5551 LT1 (ON)	1	Q2
Miscellaneous				
043-300101-000	INDUCTOR	PN:YT-10033 30uH	2	L9,10
043-560200-000	INDUCTOR	56uH YT-10779	1	L12
043-700100-000	INDUCTOR	70uHx2 YT-10024	1	L8
043-820300-000	INDUCTOR	820uH YT-10034	1	L1
044-100100-000	SMD FERRITE BEAD	PN:321611 600R/100MHz 1206	2	FB1,FB2
072-040008-110	8P Terminal Housing	JS-1001-08	1	P1
072-040064-000	Terminal (PCB TYPE)	PC250(t=0.8),T250MA	2	T2,TER6
072-040096-000	Terminal T187MA(PCB TYPE)	(t=0.8mm) PC187(0.8)	2	TER5,TER7
073-111003-000	Shorting Strap	54.9x13.6x1mm	1	J7
073-111004-000	Shorting Strap	29.5x12.4x0.8m/m	2	J4,9
074-300018-000	RELAY	PN:943-1C-48D	1	RLY1
072-040063-000	Terminal (PCB TYPE)	PC205 (t=0.5m/m) T205MA	1	
PRE DRIVER PCB				
Resistors				
024-000098-120	SMD Resistor	0R 1/8W J 0805	4	R313,314,318,320
024-100298-120	SMD Resistor	10R 1/8W J 0805	4	R89,90,140,150
024-100498-120	SMD Resistor	1K 1/8W J 0805	10	R81,85,96,97,131,137,142,147,162,179
024-100598-120	SMD Resistor	10K 1/8W J 0805	12	R75,82,83,92,98,132,133,148,163,164,181,156
024-100798-120	SMD Resistor	1M 1/8W J 0805	2	R32,33
024-110598-120	SMD Resistor	11K 1/8W J 0805	2	R74,99
024-200598-120	SMD Resistor	20K 1/8W J 0805	2	R95,141
024-220398-120	SMD Resistor	220R 1/8W J 0805	2	R136,167
024-220498-121	SMD Resistor	2K2 1/8W J 0805	1	R134
024-220598-120	SMD Resistor	22K 1/8W J 0805	1	R37
024-220798-120	SMD Resistor	2M2 1/8W J 0805	2	R87,93
024-270498-120	SMD Resistor	2K7 1/8W J 0805	3	R80,84,157
024-390498-120	SMD Resistor	3K9 1/8W J 0805	2	R130,161
024-390598-120	SMD Resistor	39K 1/8W J 0805	2	R86,94
024-470398-120	SMD Resistor	470R 1/8W J 0805	1	R91
024-470498-120	SMD Resistor	4K7 1/8W J 0805	6	R151-153,183,34,36
024-470598-120	SMD Resistor	47K 1/8W J 0805	1	R35
024-560598-120	SMD Resistor	56K 1/8W J 0805	1	R38
024-680498-120	SMD Resistor	6K8 1/8W J 0805	2	R135,166
Capacitors				
031-100244-100	SMD Ceramic Capacitor	0u01/50V K 0805 X7R	4	C108,118,131,140
031-100343-100	SMD Capacitor	100pF/50V J 0805 NPO	2	C81,84
031-100344-100	SMD Capacitor	0u1/50V K 0805 X7R	6	C75-78,82,85
031-180344-100	SMD Capacitor	0u18/50V K 0805 X7R	2	C80,83
031-470244-102	SMD Capacitor	0u047/50V K 0805 X7R	4	C93,94,101,124
031-560243-100	SMD Capacitor	56pF/50V J 0805 NPO	4	C92,102,105,125
031-560343-102	SMD Capacitor	560pF/50V J 0805 NPO	1	C79
034-100625-303	Electrolytic Capacitor	100uF/25V M (R) P:2.5	1	C117
034-100715-202	Electrolytic Capacitor 85□	1000uF/16V M (R)1017 P:5	2	C109,132
034-330615-301	Electrolytic Capacitor	330uF/16V M (R)0812 P:3.5	1	C32
Semiconductors				
051-000600-100	Transitor NPN	PN:MPSW06RLRA TO-92 (ON)	1	Q31
051-222200-100	Transitor NPN (ON SEM)	PN:MPS2222ARLRA TO-92	2	Q20,22
051-555100-000	Transistor NPN	PN:2N5551 TO-92	2	Q21,23
053-211100-000	IC;DIP,DRIVER	PN:IR2111 8PIN (IR)	2	U7,8
054-000100-100	SMD DIODE	PN:ES1D 200V 1A	2	D35,43
054-001002-100	SMD ZENER DIODE	PN:BZX84C10 10V SOT-23	2	D42,49
054-005501-100	SMD ZENER DIODE	PN:BZV55C3V6 (PHILIPS)	1	D60
054-007200-100L	SMD IC; DUAL OP-AMP	PN:M072M-TE1 DMP8 (JRC)	2	U9,10
054-033906-100	SMD Transistor	PN:MMBT3906LT1 SOT23 (ON	2	Q34,35
054-050601-100	SMD ZENER DIODE	PN:BZX84C5V6 5.6V SOT-23 C42	2	Z7,8
054-414803-100	SMD DIODE	PN:LL4148 (Vishay)	5	D36,39,46,52,61

Part number	Description		Qty	Reference Designator
PRE DRIVER PCB				
054-540100-100	SMD Transistor (PNP)	PN:MMBT5401 LT1 SOT-23	2	Q33,40
054-555100-100	SMD Transistor (NPN)	PN:MMBT5551 LT1 (ON)	1	Q32
Miscellaneous				
072-040229-000	HEADER Right Angle	PN:211-107-000-400 7PIN	1	PIN2
072-040230-000	HEADER Right Angle	PN:211-111-000-400 11PIN	1	PIN1
INPUT PCB ASS'Y (4 PCB's)				
Resistors				
021-100398-100	MF Resistor	100R 1/8W F	1	R339
021-100498-100	MF Resistor	1K 1/8W F	2	R363,381
021-100598-100	MF Resistor	10K 1/8W F	9	R338,342,343,346,348,353,355,361,368
021-100698-100	MF Resistor	100K 1/8W F	1	R383
021-100798-100	MF Resistor	1M 1/8W F	1	R356
021-100898-100	MF Resistor	10M 1/8W F	1	R362
021-110698-100	MF Resistor	110K 1/8W F	1	R347
021-121598-100	MF Resistor	12K1 1/8W F	2	R354,369
021-140598-100	MF Resistor	14K 1/8W F	1	R380
021-150198-100	MF Resistor	1K5 1/8W F	1	R341
021-162398-100	MF Resistor	162R 1/8W F	1	R384
021-220598-100	MF Resistor	22K 1/8W F	1	R382
021-267498-100	MF Resistor	2K67 1/8W F	1	R336
021-340398-100	MF Resistor	340R 1/8W F	2	R357,371
021-357498-100	MF Resistor	3K57 1/8W F	1	R335
021-430498-100	MF Resistor	4K3 1/8W F	1	R204
021-549398-100	MF Resistor	549R 1/8W F	1	R344
021-619498-100	MF Resistor	6K19 1/8W F	2	R359,374
021-620598-100	MF Resistor	62K 1/8W F	1	R214
021-680398-100	MF Resistor	680R 1/8W F	1	R360
021-787398-100	MF Resistor	787R 1/8W F	2	R350,364
021-909398-100	MF Resistor	909R 1/8W F	1	R385
021-931498-100	MF Resistor	9K31 1/8W F	1	R351
024-000097-120	SMD Resistor PN:1206J000	0R 1/4W J 1206	6	R301-303,309,296,297
024-100398-121	SMD Resistor	100R 1/4W J 1206	1	R249
024-100498-121	SMD Resistor	1K 1/4W J 1206	2	R238,264
024-100598-101	SMD Resistor PN:1206F103	10K 1/4W F 1206	5	R200B,201B,218B,219B,298
024-100598-121	SMD Resistor	10K 1/4W J 1206	16	R202,205-207,212,217,222,228,229,235,252-254
024-100698-101	SMD Resistor	100K 1/8W F 1206	4	R200,201,218,219
024-150498-121	SMD Resistor	1K5 1/4W J 1206	1	R251
024-150598-121	SMD Resistor	15K 1/4W J 1206	1	R223
024-200598-121	SMD Resistor	20K 1/4W J 1206	1	R256
024-226598-100	SMD Resistor	22K6 1/4W F 1206	4	R208,209,231,232
024-237597-100	SMD Resistor	23K7 1/4W F 1206	1	R281
024-270498-121	SMD Resistor	2K7 1/4W J 1206	1	R237
024-300398-121	SMD Resistor	300R 1/4W J 1206	1	R258
024-300598-121	SMd Resistor	30K 1/4W J 1206	1	R260
024-330498-101	SMD Resistor	3K3 1/4W F 1206	2	R203,215
024-330498-121	SMD Resistor	3K3 1/4W J 1206	1	R240
024-470498-121	SMD Resistor	4K7 1/4W J 1206	1	R210
024-470598-120	SMd Resistor	47K 1/8W J 0805	2	R280,283
024-470698-121	SMd Resistor	470K 1/4W J 1206	1	R259
024-470798-121	SMd Resistor	4M7 1/4W J 1206	2	R243,244
024-510398-121	SMD Resistor	510R 1/4W J 1206	1	R261
024-560598-121	SMD Resistor	56K 1/4W J 1206	1	R224
024-620398-121	SMD Resistor	620R 1/4W J 1206	2	R221,226
024-680498-121	SMD Resistor	6K8 1/4W J 1206	1	R247
024-680598-121	SMD Resistor	68K 1/4W J 1206	1	R250
024-820598-121	SMD Resistor	82K 1/4W J 1206	1	R263
026-100595-001	VR 10KAx2 RABOS WIDTH, LEVE	XV012311YGPJ25F15A10K-21PC/1	2	VR302,303
026-100595-002	VR 10KCx2 RABOS FREQUENCY	XV012311YGPJ25F15C10K-21PC/1	1	VR301
026-500595-254	VR 50KA GAIN	P/N:RK163111R405-EJ	1	R216
026-500595-267	VR 50KBx4 FREQUENCY	PN:RD1631411001D-50KBx4 (EJ)	1	R233

Part number	Description		Qty	Reference Designator
INPUT PCB ASS'Y (4 PCB's)				
Capacitors				
031-100244-101	SMD Capacitor	0u01/50V K 1206 X7R	4	C12,13,224,280
031-100344-102L	SMD Capacitor	0u1/50V K 1206 X7R	7	C227,229,230,232-235
031-100344-104	SMD Capacitor	100pF/50V K NPO 1206	2	C204,222
031-100345-300	SMD Capacitor	0u1/50V M 1206 X7R	2	C305,306
031-220344-103	SMD Capacitor	220pF/50V K NPO 1206	4	C200,210,215,216
031-330445-100	SMD Capacitor	3300pF/50V M 1206 X7R	1	C281
031-470444-101	SMD Capacitor	4700pF/50V K X7R 1206	1	C2G1
031-680444-100	SMD Capacitor	6800pF/50V K X7R 1206	1	C212
034-100515-300G	Electrolytic capacitor	10uF/16V M (R)0511 P:2	1	C220
034-100615-301	Electrolytic Capacitor	100uF/16V M (R)0611 P:5	1	C221
034-220516-301	Electrolytic capacitor	22uF/16V M (R)0511 P:2	2	C223,225
034-220525-300	Electrolytic capacitor	22uF/25V M (R)5x11 P:2.5 TAPIN	4	C14,15,303,304
035-100363-300	PE Capacitor	0u1/100V J P:5m/m	3	C322,323,328
035-220243-100	PE Capacitor FE-M	0u022/63V J P:5m/m	1	C202
035-330293-300	PE Capacitor PN:ESK063S33JT	0u033/63V J P:5	2	C209,218
035-330393-300	ESK Mylar Capacitor	0u33/63V J P:5	2	C207,208
035-680253-300	PE Cap FE-M PN:ESK063S68JT	0u068/63V J P:5mm	4	C201,213,380,381
Semiconductors				
050-505200-001	LED	PN:LT-2402-21	1	LED1
054-007200-100L	SMD IC; DUAL OP-AMP	PN:M072M-TE1 DMP8 (JRC)	7	U200-205,301
054-007400-100	SMD IC;(OP) QUAD OP-AMP	PN:TL074CDR (TI)	1	U300
054-011400-100	SMD Transistor	PN:DTC114TKA SMT3 (ROHM	1	Q202
054-033904-100	SMD Transistor	PN:MMBT3904LT1 SOT23 (ON	2	Q203,204
054-414803-100	SMD DIODE	PN:LL4148 (Vishay)	12	D200-205,207,209,212,216-218
Miscellaneous				
072-010058-000	RCA JACK 2P	PN:0502000W1G (Red,White)	1	J201
072-040007-000	7P Terminal housing SWA101	JS-1001-07	2	P3,4
072-040008-110	8P Terminal Housing	JS-1001-08	1	P2
072-040253-000	HEADER Right Angle	PN:211-103-000-400 3PIN	1	M3
072-040337-000	HEADER Right Angle	PN:211-110-000-400 10PIN	1	M4
072-040338-000	HEADER Right Angle	PN:211-105-000-400 5PIN	1	M3
072-060219-000	BINDING POST (gold plated)	PN:A807A-RB 8PIN	1	J200
073-010021-000	Screw base	PN:PCB-2(M3) 4PIN	3	T1,2,3
074-030002-000	TOGGLE SW	PN:L101-T2B4QE	3	SW200-202
FUSE PCB				
			1	
039-220180-100	X2 Safety capacitor 0u22/250V	18x16.5x8.5mm PN:XG275M224VHS2	1	CXAC1
043-324300-000	INDUCTOR	324uH YT-10778	1	L13
072-040064-000	Terminal (PCB TYPE)	PC250(t=0.8),T250MA	1	TER2
072-040096-000	Terminal T187MA(PCB TYPE)	(t=0.8mm) PC187(0.8)	3	TER1,3,4
073-050001-000	FUSE CLIP	P/N:CFFH1206	2	F1,B1
091-000096-000	FUSE	P/N:S506 T2A/250V 5x20mm	1	F1
MISCELLANEOUS				
008-060302-000	MODEL 88 GASKET(UL)	C4305 25x22x1m/mPSA BLK	1	R233(VR)
008-060302-072	GASKET (UL) PORON	PN:MO-48C 25x18 t=5mm PSA	4	X'FORMER
008-061215-000	GASKET C4305	12x15 t=5mm CR PSA	1	Thermister
008-062001-000	GASKET CR C4305	196x10mm t=1mm PSA	4	
008-063001-000	GASKET CR C4305	320x10mm t=1mm PSA	4	
042-014109-000	Transformer 230V/50Hz	EI-125 YT-10145	1	
061-001021-000	Knob SPL600 (black)	PN49001-WD7(46077φ16x14	3	for VR301-303
061-001052-000	Knob w/white indicator	PN:49001-W (18teeth)D=15.1 H=14.5	2	for R233,216
062-332101-000	Bucket	12.83x8.33x3.93"ABS 94V0	1	
063-010010-000	Bracket for Transistor	P/N:TRK-2	5	for Q11,13,15,17,TH1
063-332109-900	PANEL (SW-12 230V)	12.83x8.33" t=.984" SPCC	1	
073-014044-000	Bracket	6.64"x3.50"x3.20" SPCC	1	
074-020018-000	ROCKER SW (POWER)	PN:RF1003-BB4-0	1	
086-021818-030	VDE Power cord LF2-75	6ft 2PIN black	1	


TOP LAYER
TOP
BOTTOM LAYER
BOT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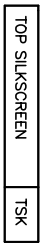
C211
C221
Q200
V-
CONN4
J201
C202
C14
C15
P2
C207
R214
C208
R204
M3
M4
C223
C214
P3
C225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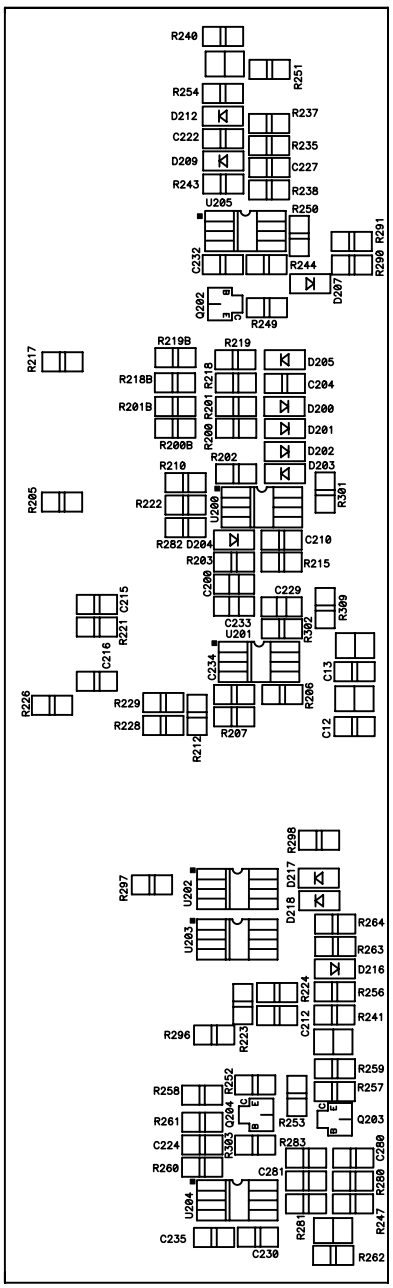
TSK

BOTTOM SILKSCREEN
B2K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D212
R237
C222
R235
D209
C227
R243
R238
U205
R250
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R290
R291
D207
Q202
R249
R217
R219B
R219
D205
R218B
R218
C204
R201B
R201
D200
R200
D201
R200B
D202
R202
D203
R210
R205
R222
U200
R301
R282
D204
C210
R203
R215
C200
C229
R300
C233
R302
C215
R221
U201
C216
C234
C13
R226
R229
R206
R228
R207
C12
R212
R298
R297
U202
D217
D218
R264
U203
R263
D216
R224
R256
C212
R241
R296
R223
R259
R258
R252
R257
R261
Q204
R253
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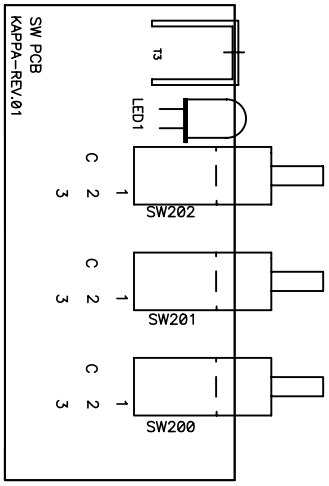
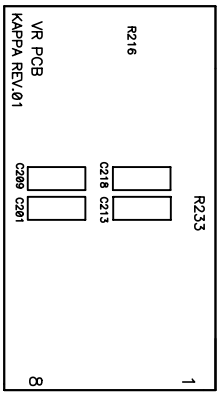
C280
R280
U204
R247
C235
C230
R281
R262


SW PCB
KAPPA-REV.01
T3
LED1
SW202
SW201
SW200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R233
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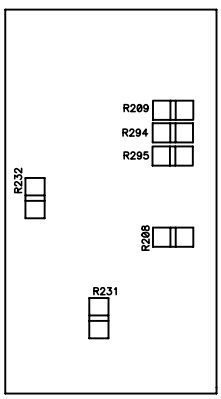
C201
C218
C213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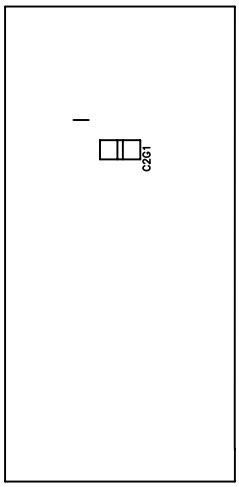
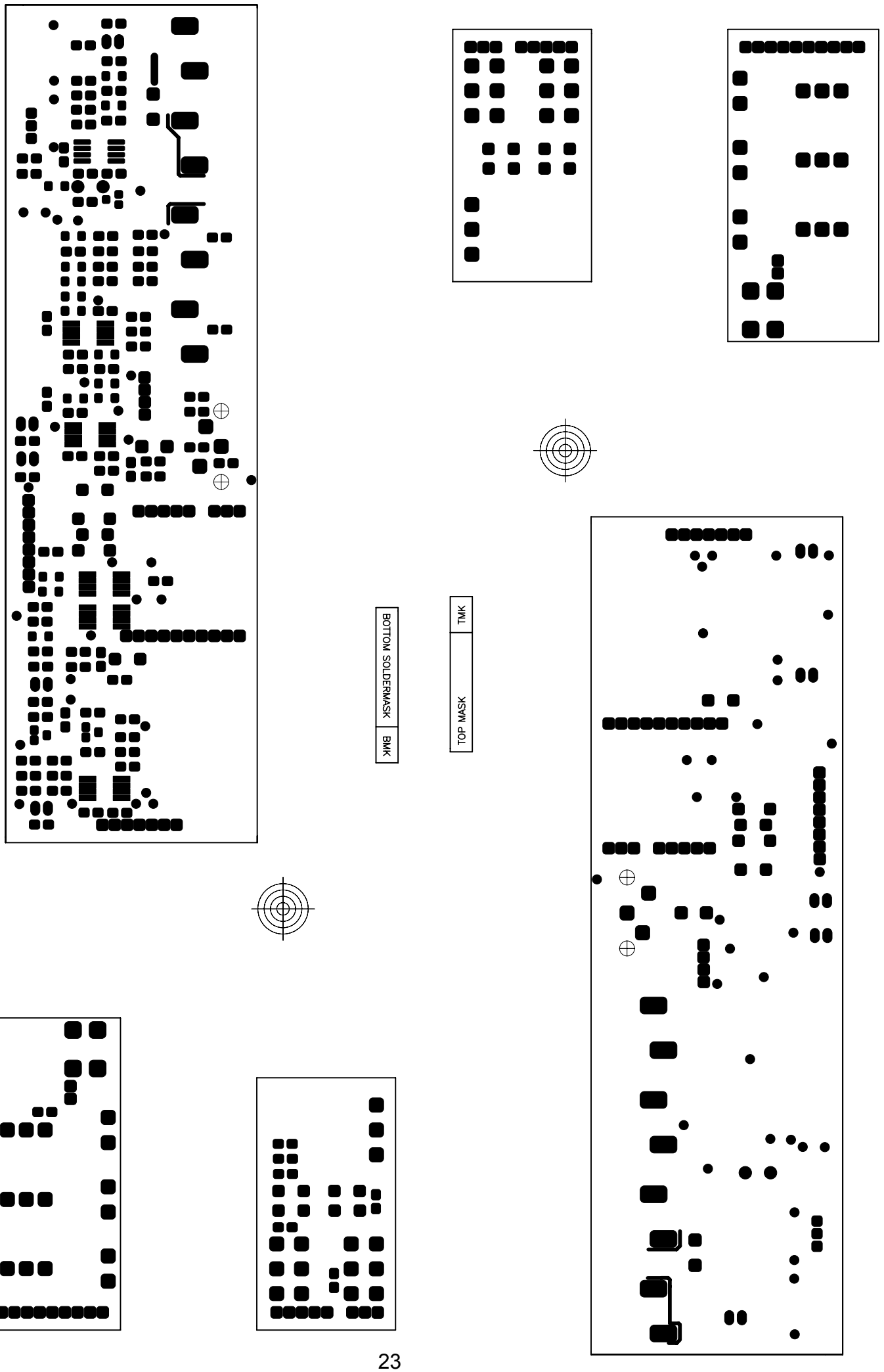
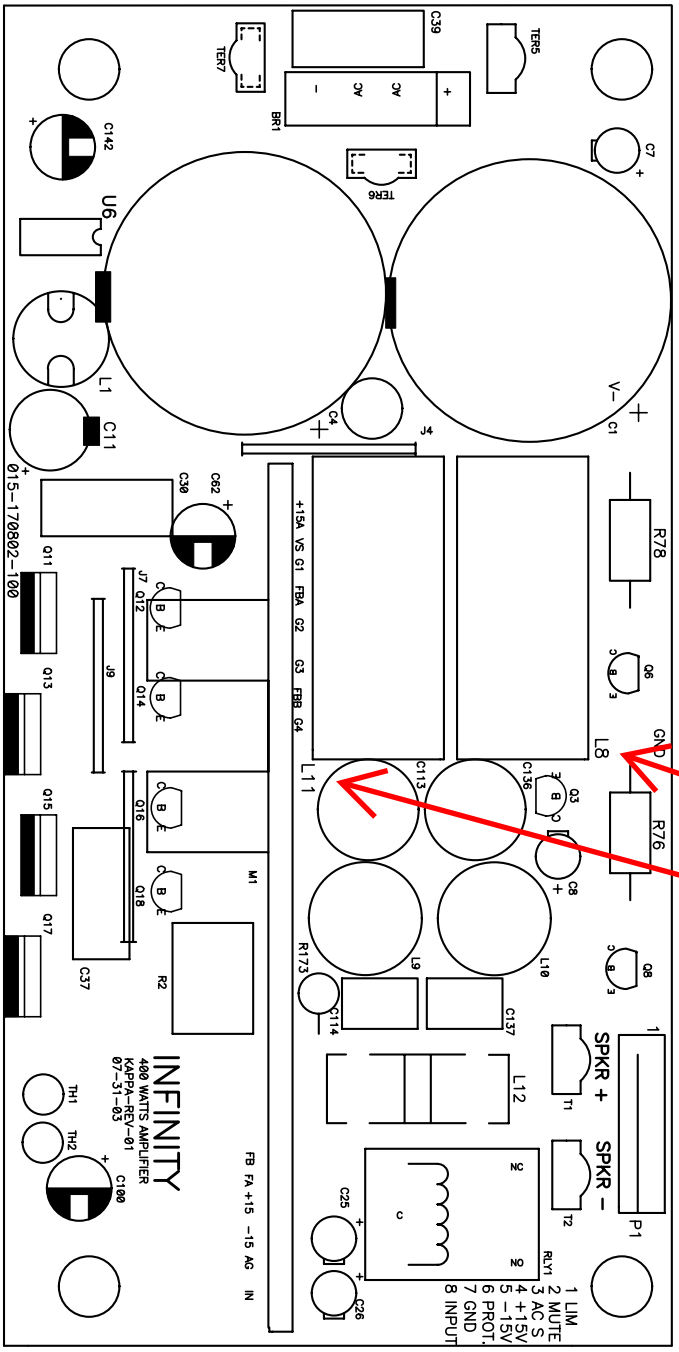
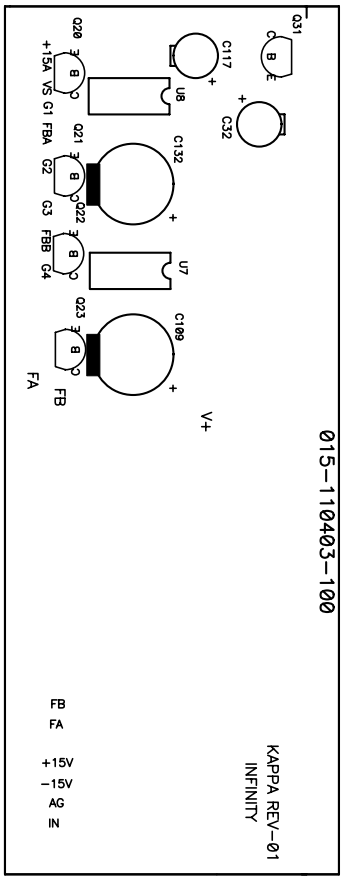
R231

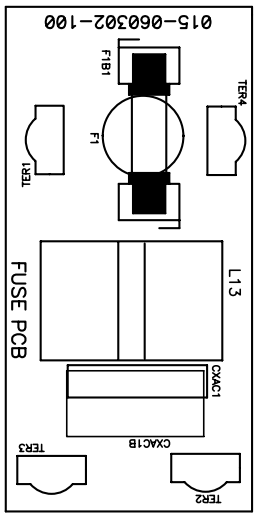

C101

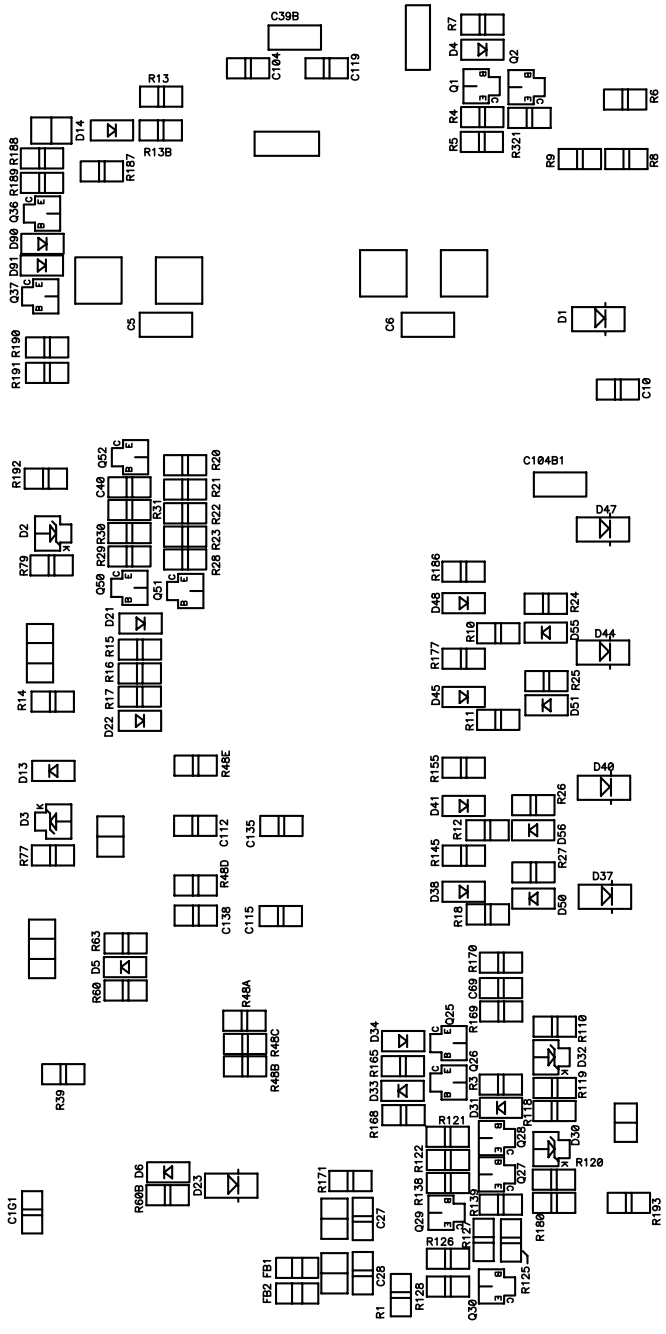

BOTTOM SOLDERMASK
BMK
TOP MASK
TMK

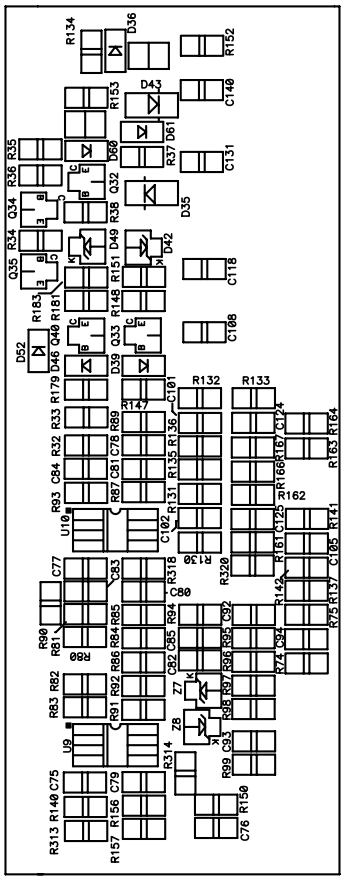


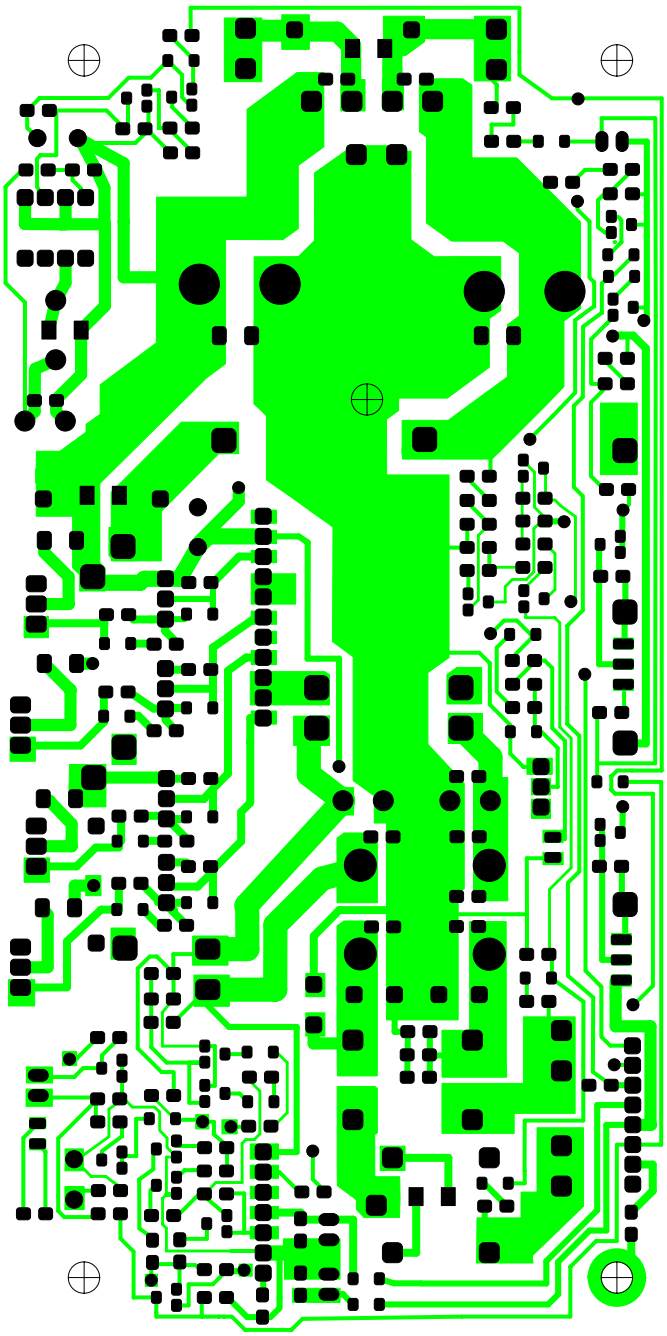
NOTE: DESIGNATORS ARE WRONG (SWAPPED) FOR L8 AND L11. BOTH DRAWING AND ACTUAL PCB ON MODEL FIFTEEN

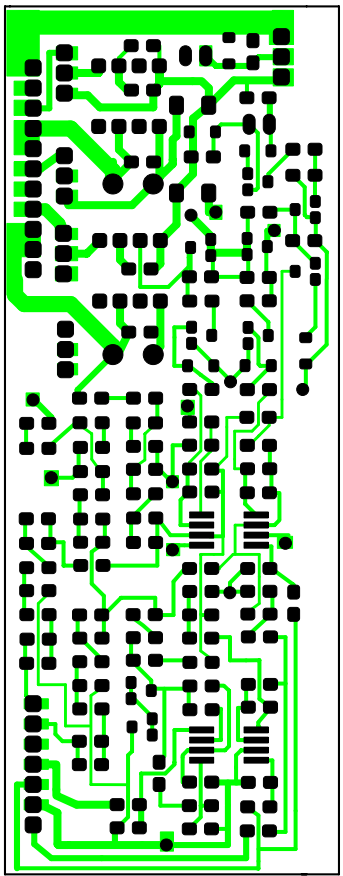


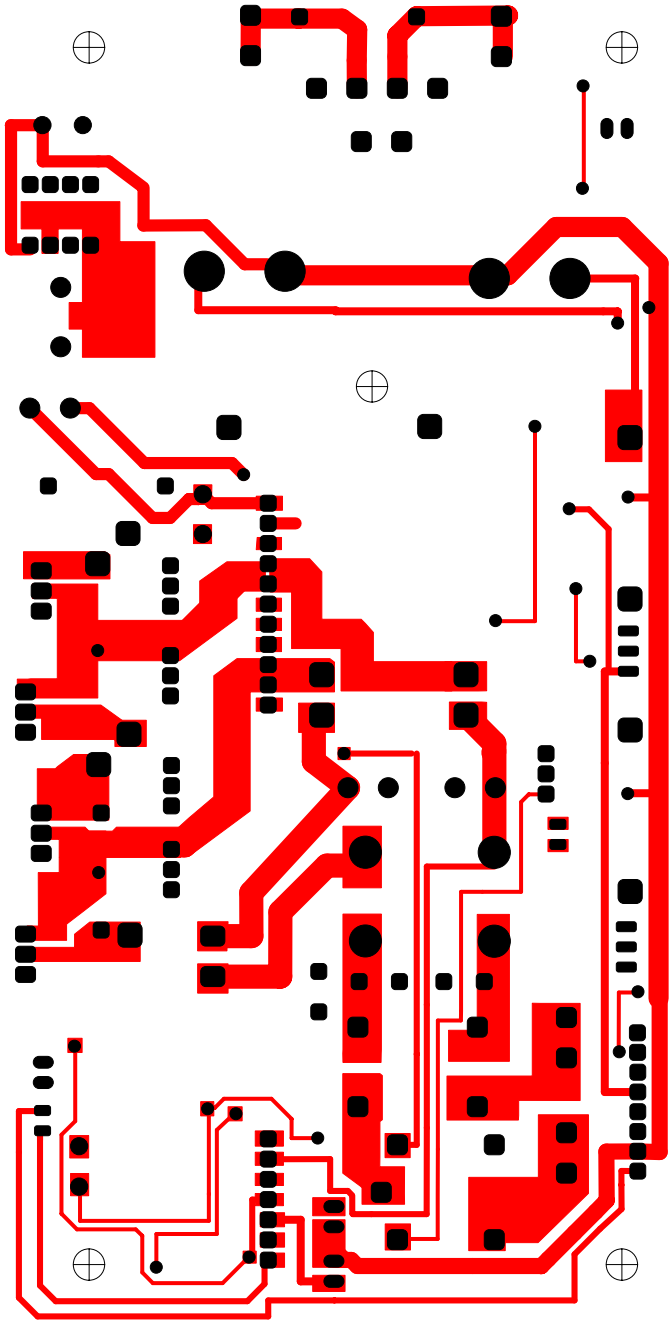


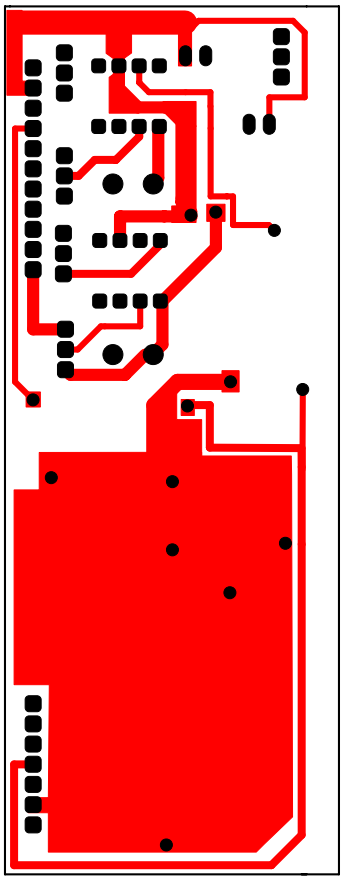


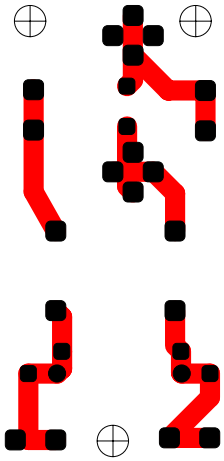


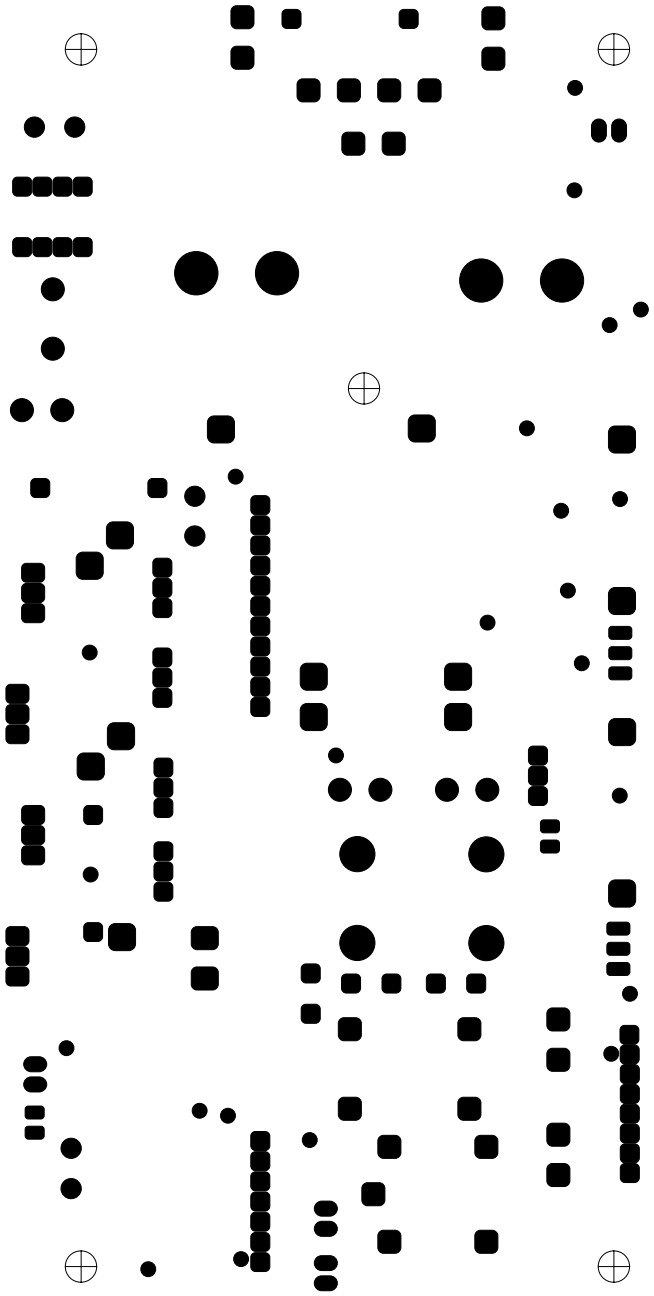


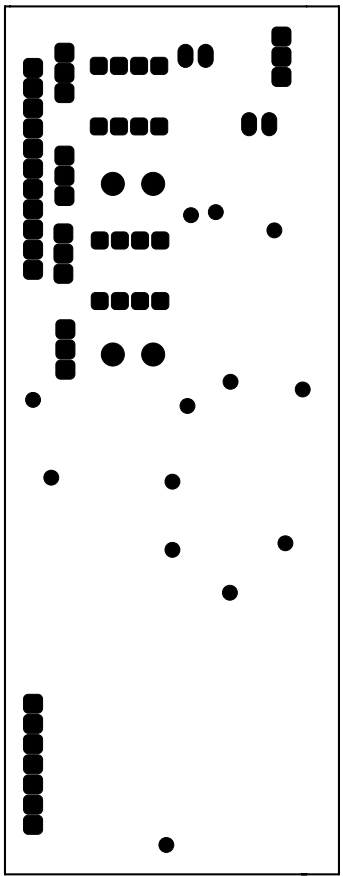


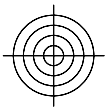


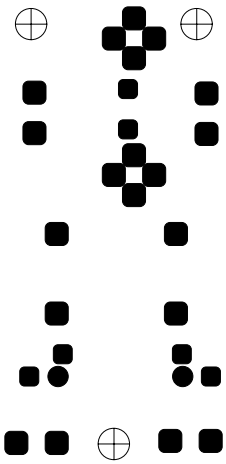


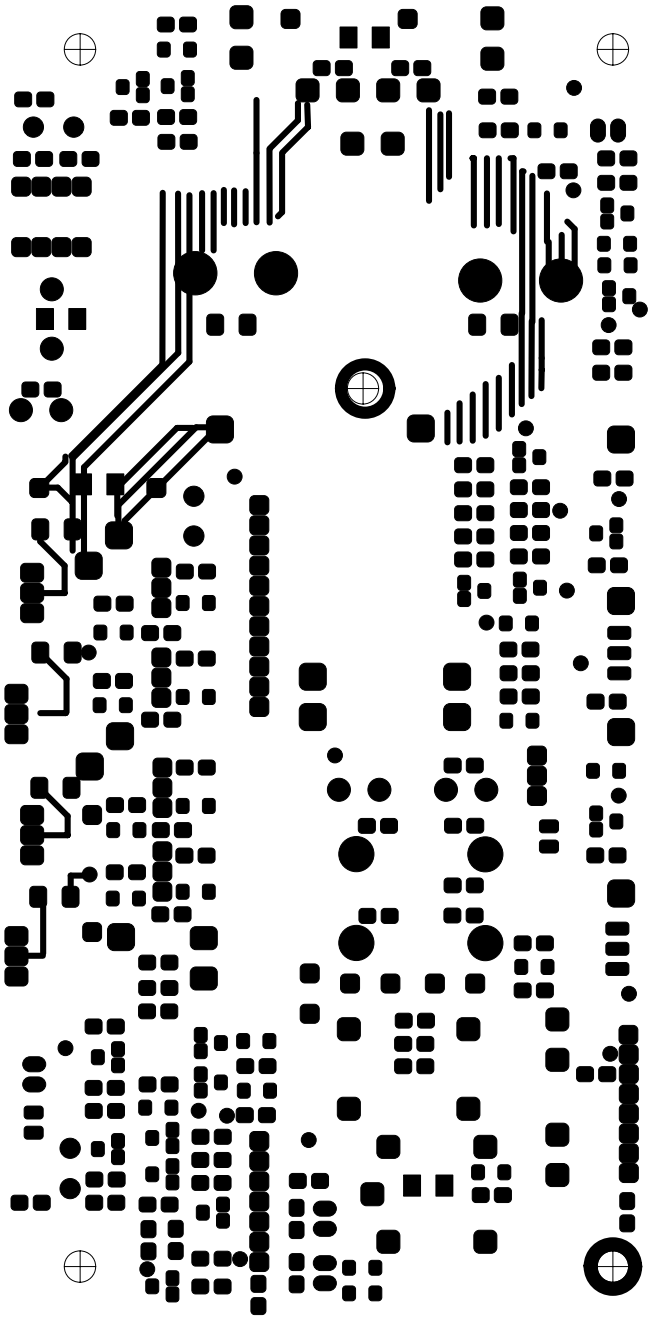


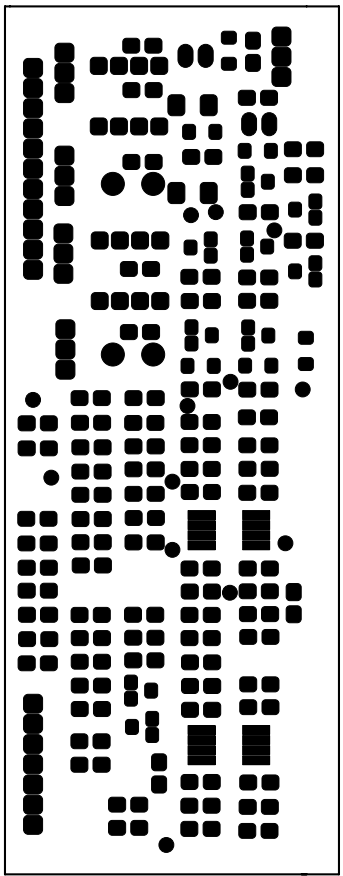


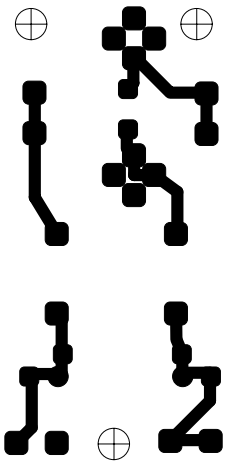








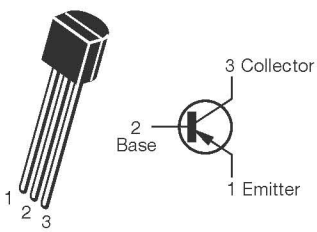




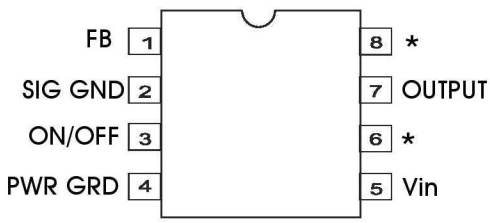
Integrated Circuit/Transistor Diagrams

MPSW56, 2N2709A, 2N5401

Q3,8,12,14,16,18

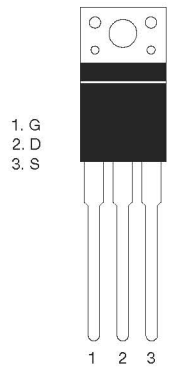


LM2574
U6



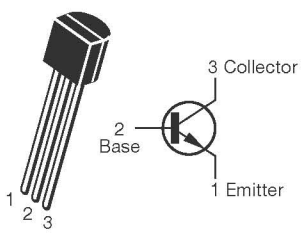
* No internal connection, but should be soldered to PC board for best heat transfer.

MOSFET IRF640
Q11,13,15,17



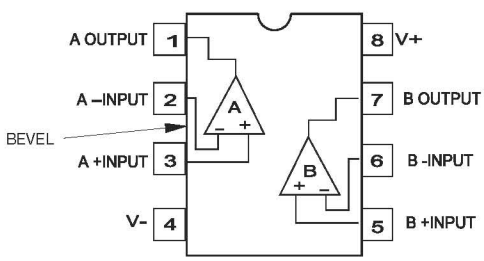
MPS2N222
MPSW06, 2N5551

Q6, 20-23,31

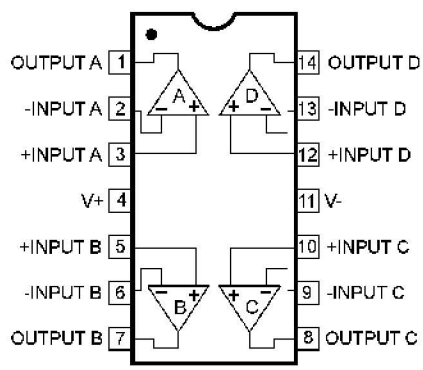


OPAMP, DUAL
TL072CDR SO-8,

U9,10,200-205,301

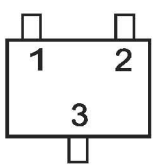


OPAMP, QUAD 14P DIL TL074
U300



* MMBT3904LTI SOT23,
* MMBT3906LTI SOT23,
DTC114TK SMT3,
* MMBT5401 LTI,
* MMBT5551 LTI

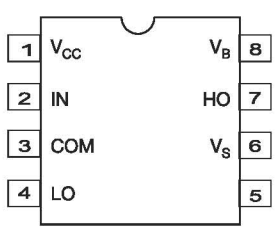
Q1,2,25-30, 32, 33-37,40,50-52,40,202-204



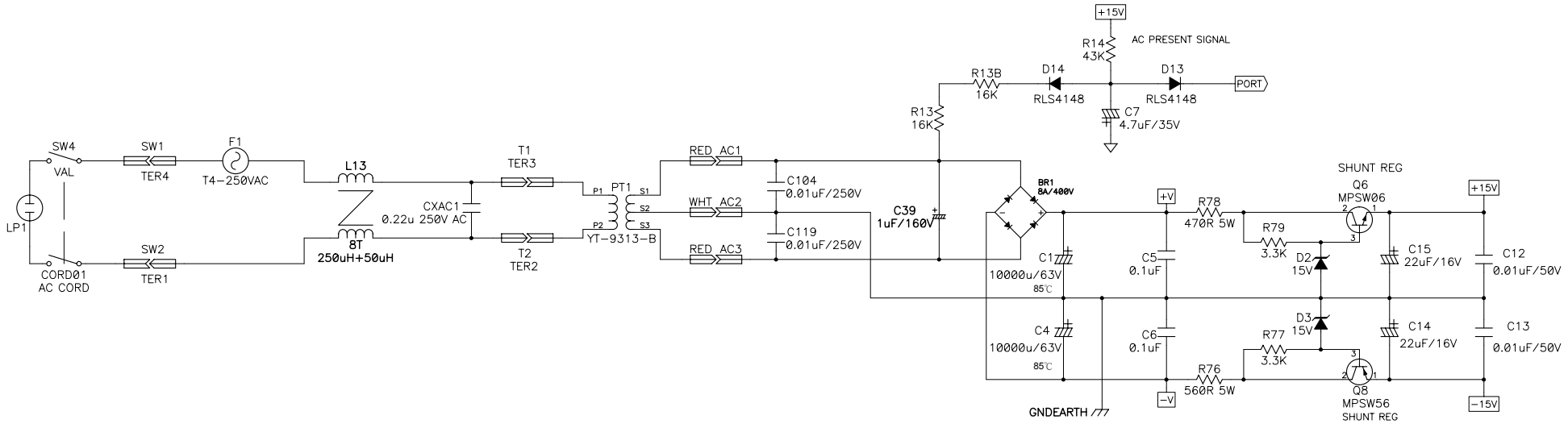
1) Emitter
2) Base
3) Collector

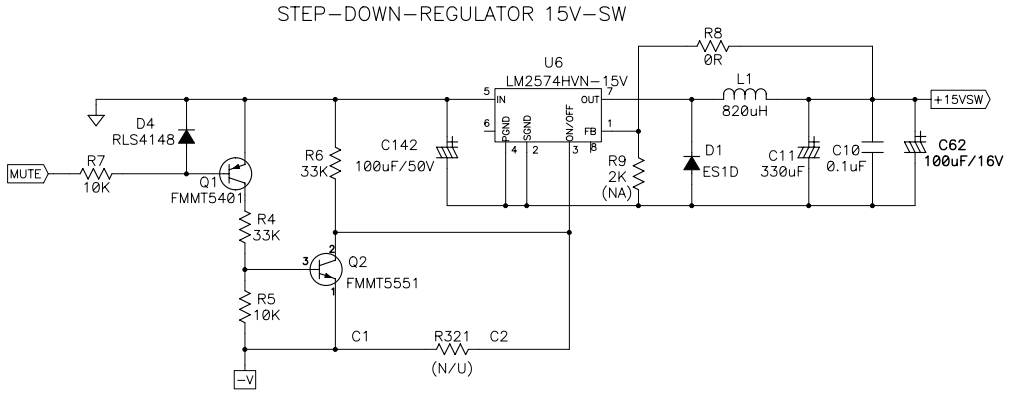
* PREFIX MAY BE "FMMT"

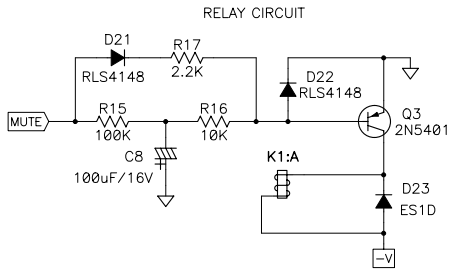
IR2111 HALF-BRIDGE DRIVER
U7,8



SW-12





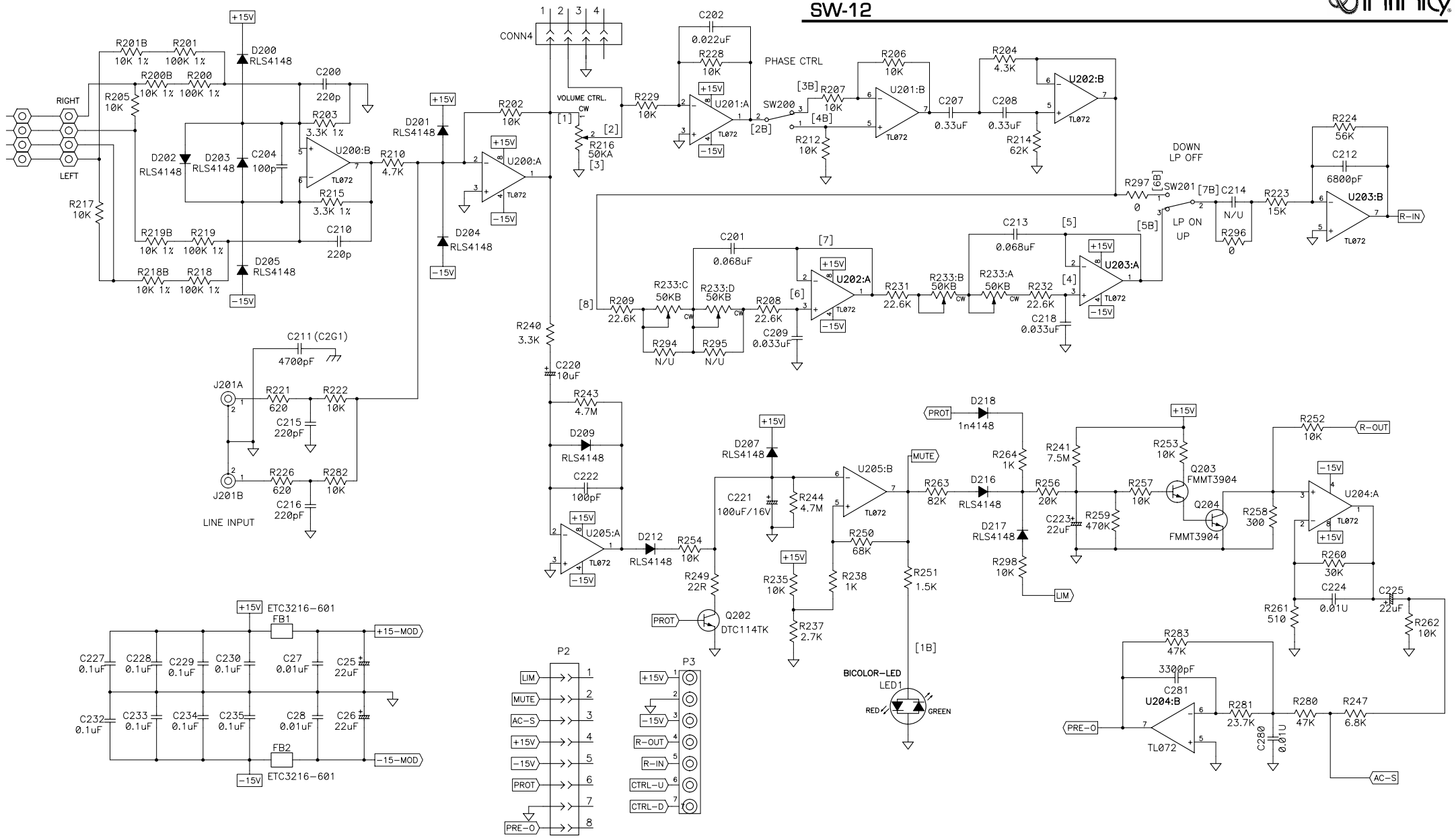


Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By	
01	New DESIGN	2004/04/26							: 416-0390901-000
									Model no: SW-12-120V
									Sch name: SW-12-120V.sch
									Issue no: ET-01-21-4691
									Date: 2004/04/26
									Sheet: 18 Rev: 01
									Size: A2 Author: Belle

OPTIONAL EXTERNAL VOLUME CTRL NOT USED IN SW-12 MODEL

SW-12

Infinity



Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By	
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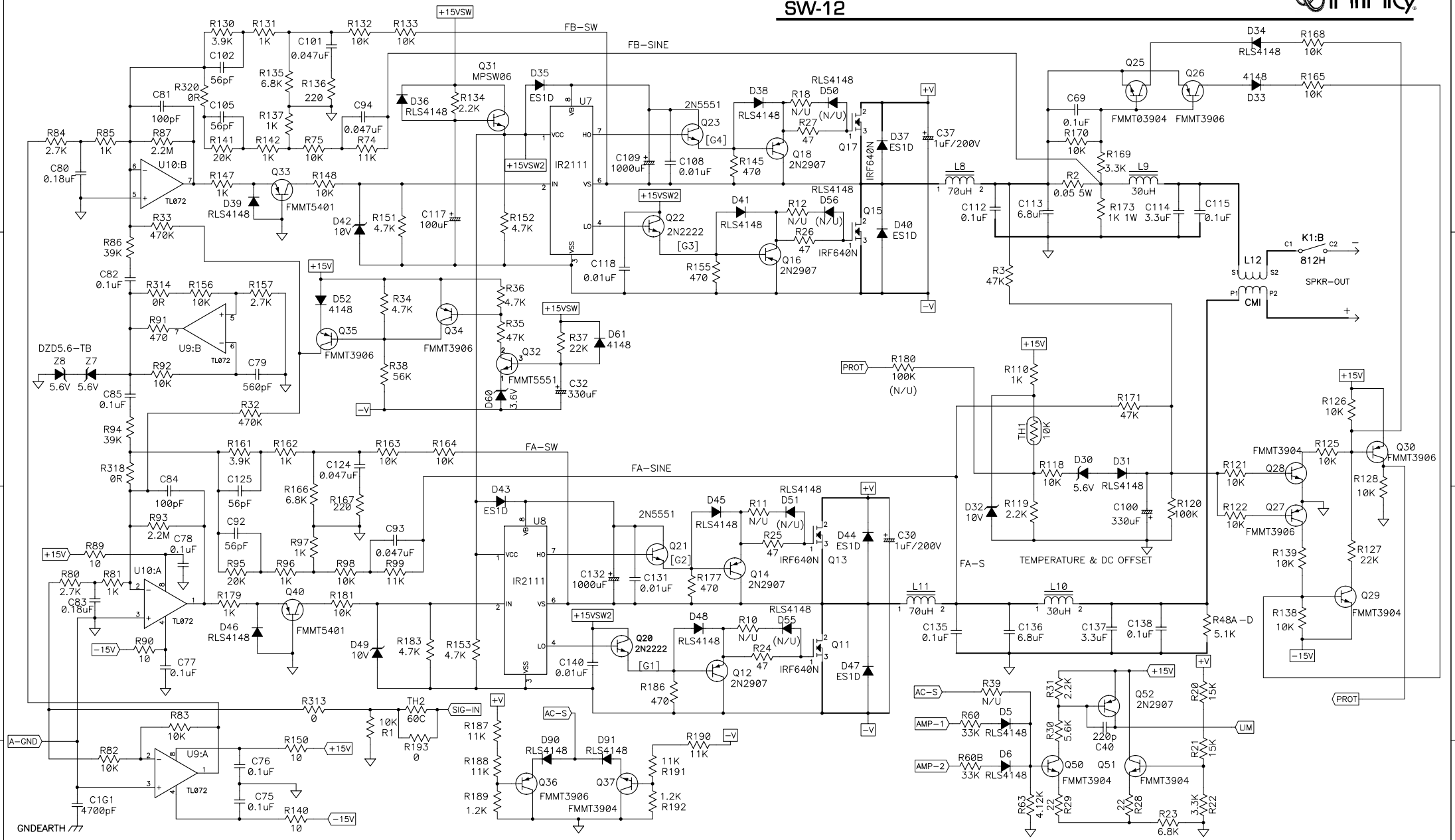
									Model no: SW-12-120V
									Sch name: SW-12-120V.sch
									Issue no: ET-01-21-4691
									Date: 2004/04/26
				32					Sheet: 19 Rev: 01
									Size: A2 Author: Belle

SW-12

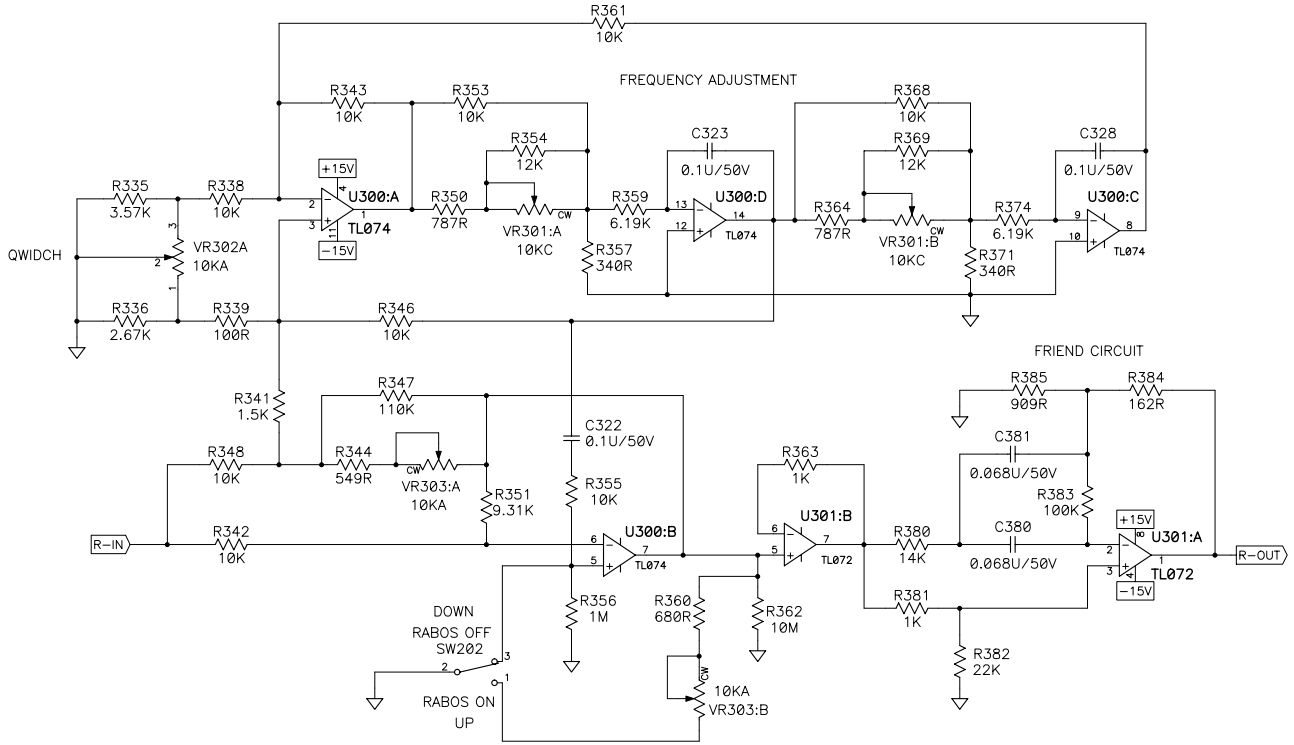


Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By
01	New DESIGN	2004/04/26						

33

	JBL Prof
:	416-0390901-000
Model no:	SW-12-120V
Sch name:	SW-12-120V.sch
Issue no:	ET-01-21-4691
Date:	2004/04/26
Sheet: 20	Rev: 01
Size: A2	Author: Belle

SW-12



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									Model no: SW-12-120V
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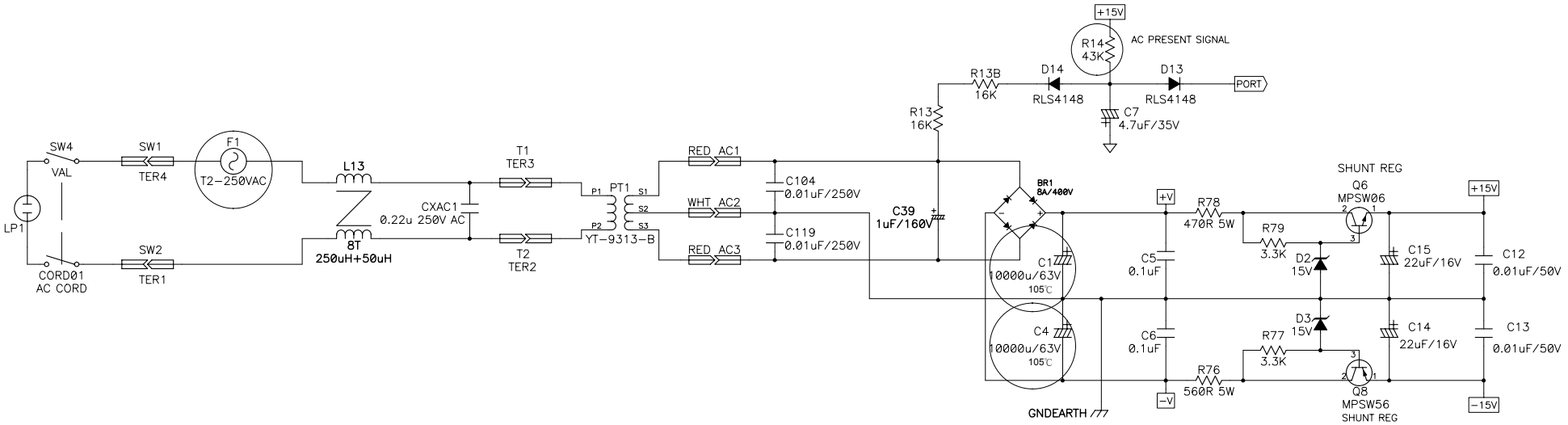
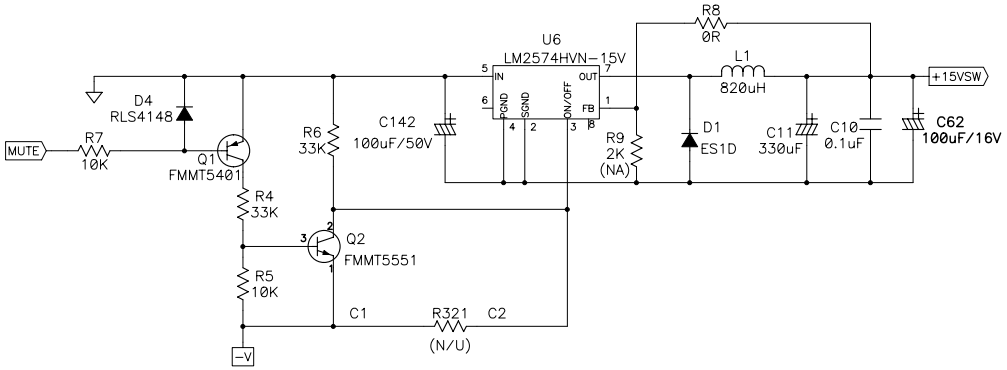
									Issue no: ET-01-21-4691
									Date: 2004/04/26
									Sheet: 21 Rev: 01
									Size: A2 Author: Belle

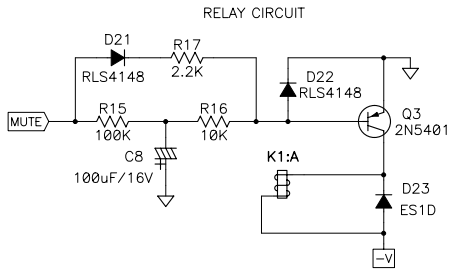
SW-12



STEP-DOWN-REGULATOR 15V-SW



RELAY CIRCUIT



Rev:	Notes:	Date:	Rev:	Notes:
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02	CHANGE:R14,F1,C1,C4	2004/04/26		

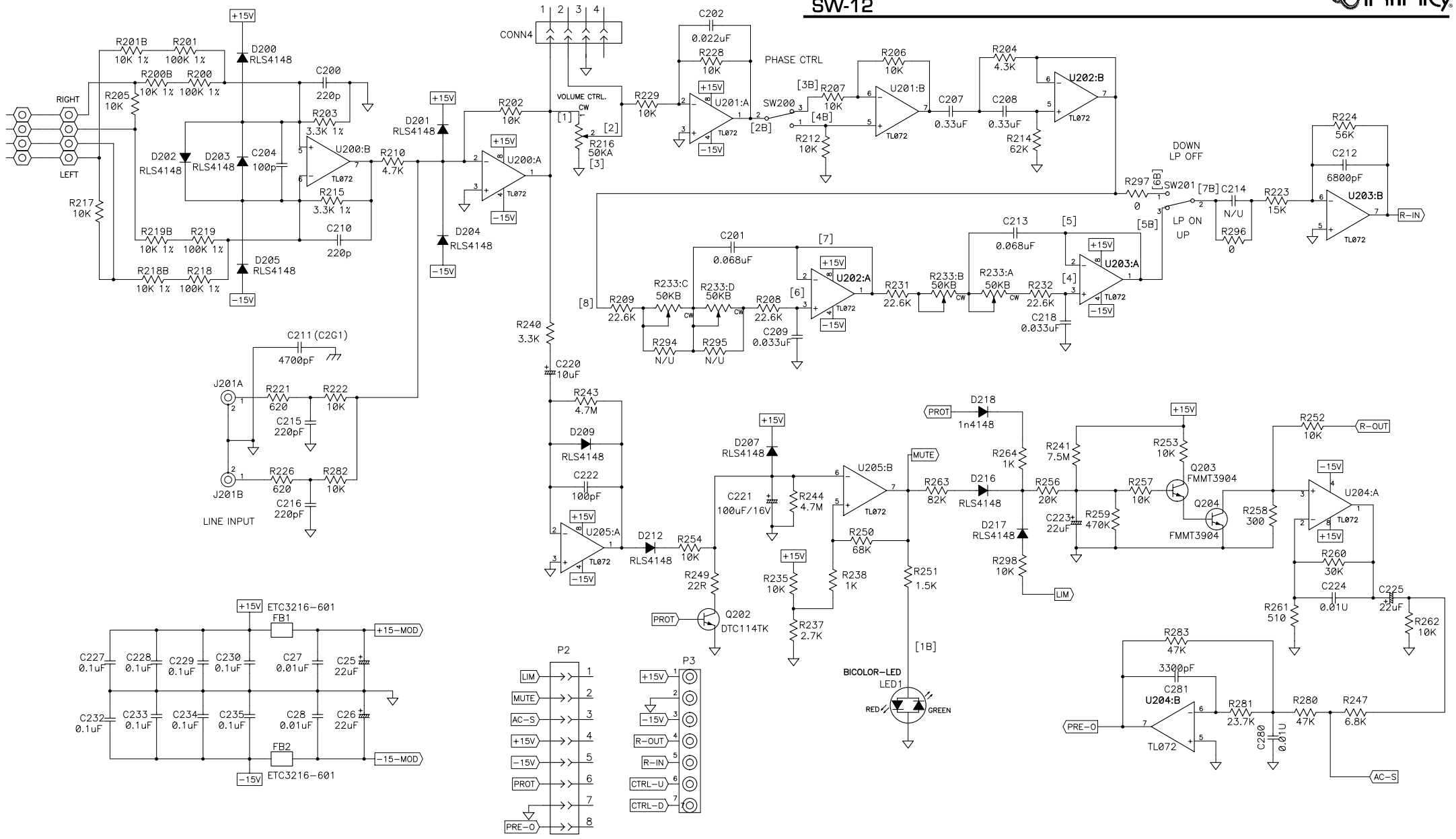
Draw by	Designed by	Checked by	Approved By

:	416-0300201-000
Model no:	SW-12-230V
Sch name:	SW-12-230V-2.sch
Issue no:	ET-01-21-4693
Date:	2004/04/26
Sheet: 18	Rev: 02
Size: A2	Author: Belle

OPTIONAL EXTERNAL VOLUME CTRL NOT USED IN SW-12 MODEL

SW-12

Infinity



Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By	
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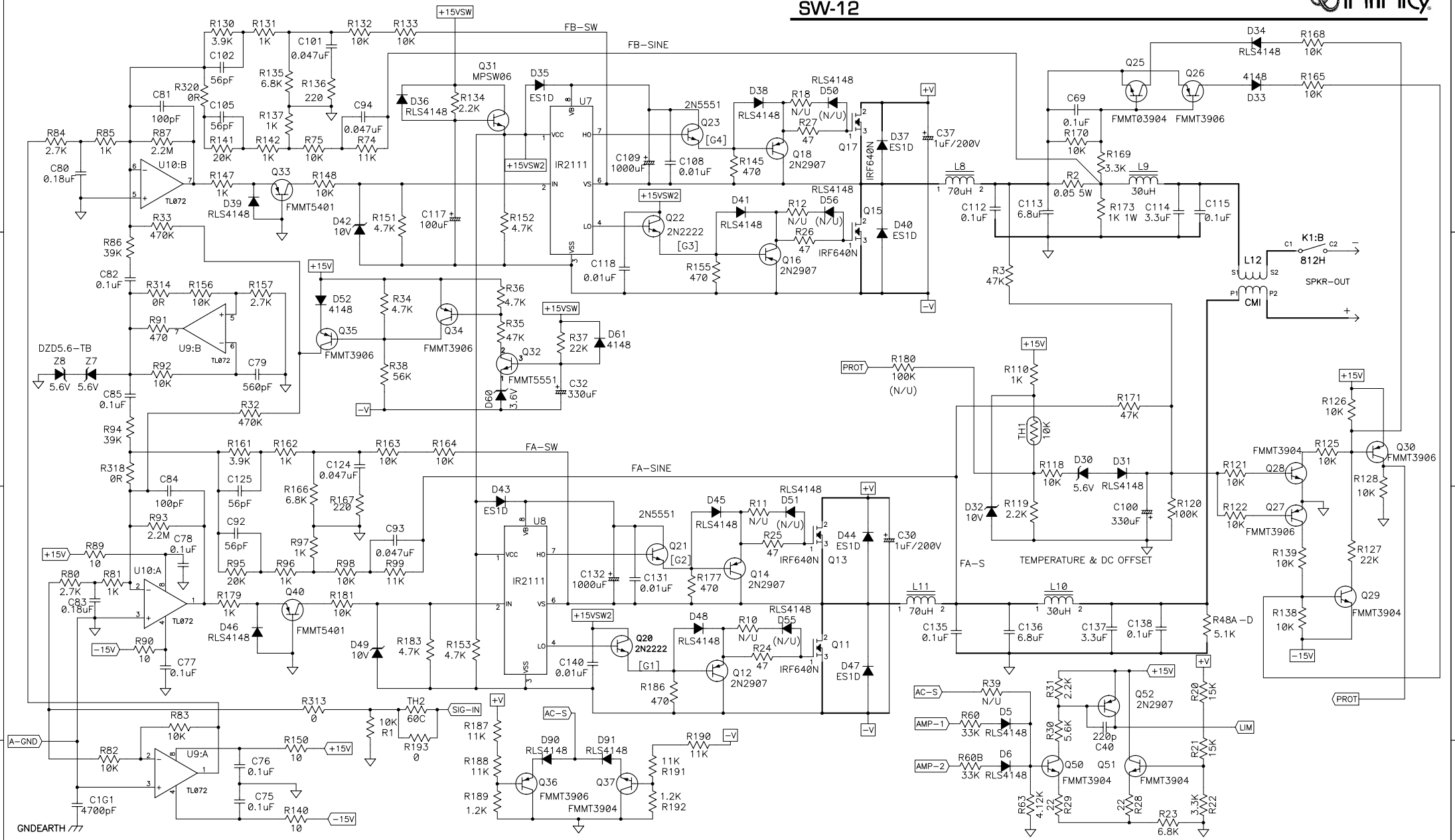
02	CHANGE:R14,F1,C1,C4	2004/04/26							Model no: SW-12-230V
									Sch name: SW-12-230V-2.sch
									Issue no: ET-01-21-4693
									Date: 2004/04/26
				36					Sheet: 19 Rev: 02
									Size: A2 Author: Belle

SW-12



Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By
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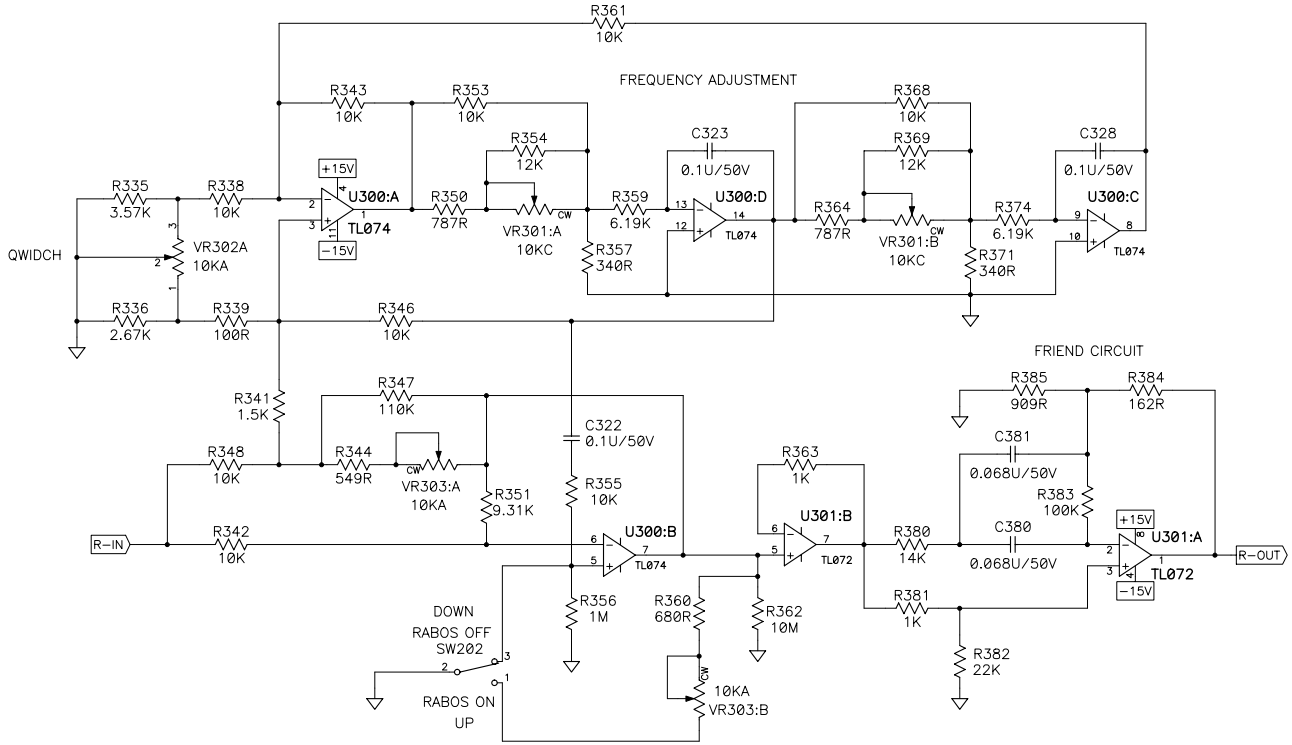
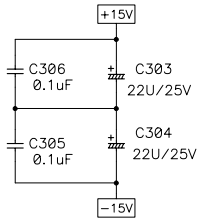
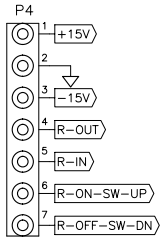
02	CHANGE:R14,F1,C1,C4	2004/04/26						

	JBL Prof
:	416-0300201-000
Model no:	SW-12-230V
Sch name:	SW-12-230V-2.sch
Issue no:	ET-01-21-4693
Date:	2004/04/26
Sheet: 20	Rev: 02
Size: A2	Author: Belle

SW-12







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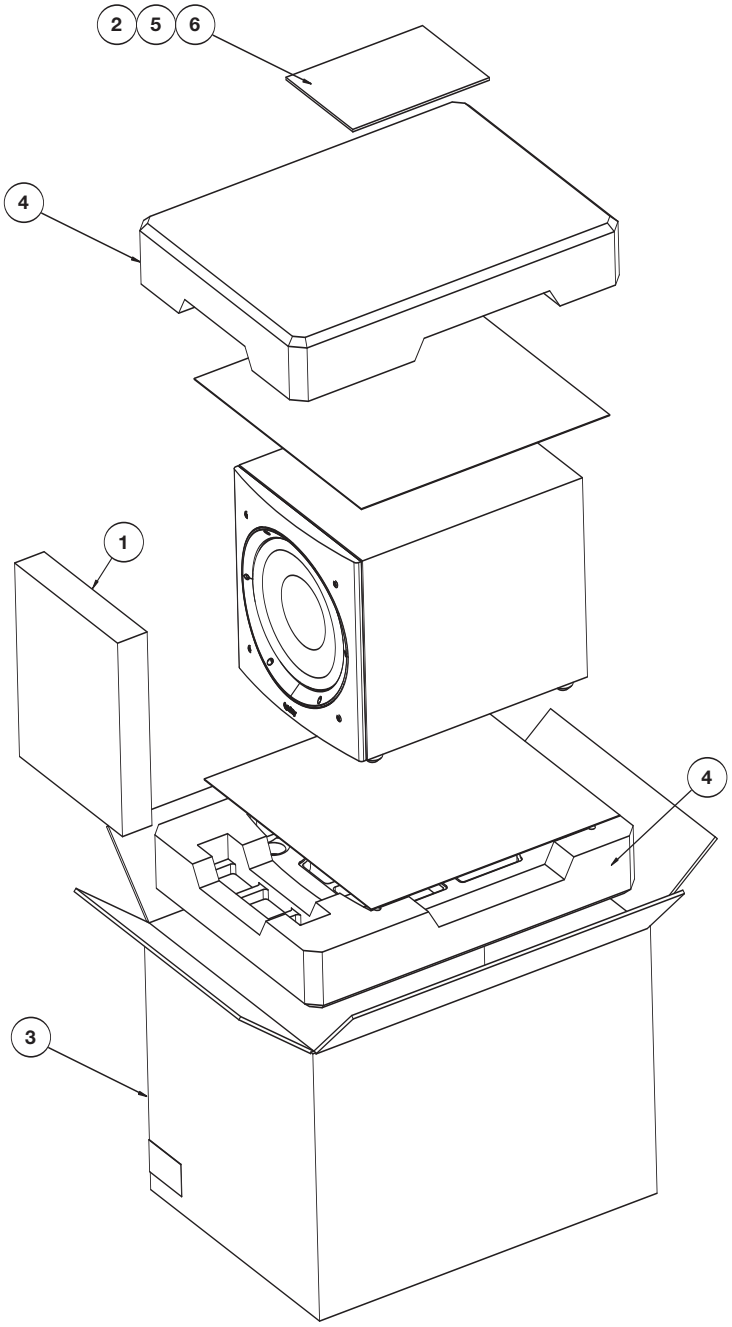
02	CHANGE:R14,F1,C1,C4	2004/04/26							Model no: SW-12-230V
									Sch name: SW-12-230V-2.sch
									Issue no: ET-01-21-4693
									Date: 2004/04/26
									Sheet: 21 Rev: 02
									Size: A2 Author: Belle

SW-12

PACKAGING



ITEM NO.	DESCRIPTION	QTY.	PART NO.
1.	Grille Assembly, Frnt SW-12 (Black)	1	352050-003
	(Beech/Cherry)	1	352050-004
2.	Owner's Manual SW-12	1	352614-001
3.	Outer Carton SW-12 (Black)	1	352151-001
	Outer Carton SW-12 (Beech)	1	352151-002
	Outer Carton SW-12 (Cherry)	1	352151-003

ITEM NO.	DESCRIPTION	QTY.	PART NO.
4.	End Pad, Top & Bot SW-12	2	352152-001
5.	Warranty Card, 3/5 Year, Infinity	1	352004-001
6.	Spike Foot Set	1	338076-001